R. K. BHANDARI

DISASTERS

Short Stories, Essays & Anecdotes

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Young India Library

DISASTERS

Short Stories, Essays and Anecdotes

R.K. BHANDARI

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This book is a humble offering of the SSS Foundation to Shyam and Sushila-my revered parents, and to Sneh-my loving sister. Even decades after they have gone, the stories of their lives remain as fresh, unforgettable and hugely inspiring. Their mission was to live for others, and to bind the world around them with the glue of everlasting relationships.

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Preface

I was born in India in a culture and an age in which storytelling used to be the pastime of elderly people, especially grandmothers. It was a time-tested, traditional instrument of character building in Indian families, and societies. Very early in my schooling years, I have had a fair share of fascinating and inspiring stories of all kinds coming in from all directions. As an adult, however, especially during my formative period as a young scientist, I grew up in a no-nonsense environment in which storytelling was nearly taboo. "Why tell a story, come straight to brass tacks," told John Hutchinson, my Supervisor, when I tried to provide him with graphic details of how my boat toppled into the coastal waters while I was surveying a coastal mudslide at the Bouldnor Cliff, off the coast of the Isle of Wight, in the United Kingdom. He was a *man of substance*, highly focused on his work and had neither interest nor time to spend on stories. It did not take me long to realise that my new work culture was different and that where there was a relentless craving for perfection, the stories, important as they may be, would have to be told more by silence than by speech.

In the ultimate analysis, I consider myself singularly fortunate to have had a fair mix of exposure to the best of the above two contrasting ways of living. To me, John Hutchinson told no stories, but his life itself was an inspiring story for me, and remains so even years after he is no more.

He was a story-maker who taught his students by his own example, which is why, personally for me, the lessons taught by him are unforgettable even 50 years after they were taught. Unlike John Hutchinson, who spent his full life, creating a story as people watched him do so, in the world of disasters, many story-makers do not even wait for people to eyewitness their remarkable feats, let alone finding time to tell their tales before they finally depart. And when there are no eyewitness accounts and documentation of their continuously unfolding saga of courage and achievement, often the loss is incalculable and permanent. It is our responsibility, therefore, to write and spread their stories whenever possible, firstly because they may otherwise get lost somewhere in the corridors of time and also because it is only through the medium of such stories that we can learn lessons beyond classroom teaching and see the facts on disasters, beyond their face value.

The true stories in this book, save sugar coating here and there, with popular tales and anecdotes, are being told to introduce multi-faceted aspects of disasters and to create curiosity of learning from and about disasters. These stories, by design, are long enough to cover the subject and short enough to sustain the excitement of the reader. I still remember the stories I was told more than six decades ago because they were short and penetrating. Those who have read the Collected Works of Rudyard Kipling would recall, "If history were taught in the form of stories, it would never be forgotten." I say, why history only? If subjects like moral science and disaster management were to be taught through stories, the lessons would stick forever. In fact, underrating the power of stories will mean undermining the very edifice of knowledge we seek to erect. It is only through *speaking stories* that we can spread the fire of imagination and transform people from story readers to story makers!

I have been writing some of the short stories, essays and anecdotes for the book now in your hands, for many years,

hoping that someday the book will see the light of the day. I had to hold the evolving stories inside me all these years, for a variety of reasons. As the clock kept ticking, I felt the same way as Mark Twain who said, "Sometimes my feelings are so hot that I have to take the pen and put them out on paper to keep them from setting me afire inside; then all that ink and labour are wasted because I can't print results." Nevertheless, by hindsight, I feel the delay in publishing the stories was perhaps the design of Providence to allow me sufficient time to fuel my passion to its peak and ripen my experience to the point that I could do some justice to my responsibility as a story-teller.

My exposure to teaching and practice of disaster management has left me in no doubt that the main reason why we have failed to learn from disasters is because knowledge for us has become a caged parrot fed on college education and scholarly publications, whereas true teaching-learning process can thrive, from one generation to another, only by learning from disasters and through inspiring examples left behind by those who died so that we could survive!

To the best of my knowledge this is the first book of true stories on different facets of disasters which comes to you with a multitude of lessons in disaster safety. What makes the book somewhat special is that these stories are hitherto untold and captivating. Although a publisher normally measures the success of a book in terms of its total sale value, there is no simple way the real worth of this book can be judged, if it succeeds in capturing the imagination of the reader.

Of the many things, this book will also teach that even those unequal within a society are equal before disasters. Kings and Queens, Presidents and Prime Ministers, Intellectuals and Idiots, and the Rich and Poor all find a level playing field when they come face to face with disasters. Only by building the culture of safety by cooperative endeavor can mankind be saved from the wrath of disasters.

Although the book contains many stories, even if one of them succeeds in touching your hearts and refreshing your minds, the temerity of my writing will be wholly justified.

Kaushambi, Ghaziabad
10 September 2017

R. K. BHANDARI

Foreword

True stories with sound basis and the art of communication have eternal appeal to young children and indeed men and women of all age groups. The distilled wisdom of centuries about education is beautifully summed up by Oscar Wilde who said, "Anything worth knowing cannot be taught", and this is certainly more true of disasters, whose origin and subsequent devastation compel us to explore new ways of communication, explore deep science and effective mitigation technologies. Stories about disasters and lessons learnt not only motivate people to go through the pain of bad times with the pleasure of self-learning but also make them experience diverse aspects of disasters; years, decades and centuries after these have occurred, and that too, from the cosy vantage point of safety but with concern and a conscious mind.

It is apt to recall Stephen R. Covey who once said, "Motivation is a fire that burns from within. If someone else tries to light that fire in you, the chances are that it will burn very briefly". In the case of disasters, the stories are generally self-igniting and fascinating because they grow in the womb of disasters themselves, and when captured at the time of convolution and convulsion, these acquire the power to communicate across generations. It is to be realised that narrating captivating stories with context, facts and purpose demand understanding and the art of storytelling —is a rare skill that is becoming rarer.

It has become more or less a coffee table discussion for some people to criticise the way disaster education is being imparted. Most of the people do not show responsibility for improvements, nor do they have a concerned mind which connects them to society. The efforts to create genuine interest in understanding of disasters and their mitigation should be enriched and enhanced through catalytic processes of creative motivation.

All of us must realise that it is a challenge to address issues such as quality of teachers, quality of books, design of syllabus and above all, sharing of excitement in the learning related to disasters. Also, many approaches originate from living examples and role models. It is clear that we need to bring new concepts and modern technology but that alone would not work unless we free ourselves from the shackles of myths and unbaked knowledge. We need to commit to change our hardened mind-sets to clear thinking & understanding and embrace right approaches and practices.

About eighty percent of the world population lives in developing countries where the poorest of poor population remains most vulnerable to disasters, not to speak of millions of others. The message of disaster safety generally does not reach them because of their inaccessibility to formal education as also because of the communication and implementation gaps in the complete chain of processes. With an increase in the frequency and magnitude of disasters across the globe, it is time that we begin to set examples. Albert Einstein has rightly said, "Setting example is not the main means of influencing others, it is the only means."

The book 'Disasters: Short Stories, Essays and Anecdotes' is authored by Prof. R. K. Bhandari. This is a unique and fascinating reading treasure. It is a captivating story book and hopefully it will hit the ground running to benefit a wide range of readership, especially the students and teachers. I have personally gone through the book from page to page

and find it to be an inspiring source of knowledge enriched with the facts of science, technology and history.

Indian National Academy of Engineering (INAE), the premier body of engineering in the country, fully realises the importance of the subject of Disasters. INAE has created a dedicated Forum on Disaster Mitigation with Prof. R. K. Bhandari as its Chairman. It is my hope that the Forum, among other issues of high end-engineering, will also try to bring the power of science and technology to the door step of students, teachers and the people at large.

I am happy that the National Book Trust, India is publishing the book under its Young India Library Series with a plan to improve its reach through publication in other Indian languages, and by making the book affordable to most.

I wish the readers a rewarding experience and purposeful motivation to serve the cause of disaster mitigation. I also wish to congratulate Prof. RK Bhandari; for engaging in this mode of communication especially to young minds, based on his rich and valued expertise and experiences.

DR. BALDEV RAJ
President
Indian National Academy of Engineering
New Delhi

19 August 2014

1

ARE DISASTERS AN ACT OF GOD?

"Mama, Mama: do you know that the State of Uttarakhand in northern India has been hit by a major disaster early this morning? I've just heard the BBC. It reports of several things —bursting of a glacial lake up in the Himalayas, large scale flooding, landsliding, collapse of buildings, roads and disruption of the communication network. Hundreds of men, women and children are reportedly buried under the heaps of debris," said Rohini.

"Oh no Rohini, not again, I pray. Only last year your uncle Tom and aunty Mary had a miraculous escape from a landslide in the Chamoli district of the very same State, you might recall. They told me at that time that disasters in Uttarakhand are frequent and yet we have not done enough to prevent them from happening. When the great Alaknanda tragedy struck the State in July 1970 because of the bursting of a landslide dam at the confluence of river Patal Ganga with river Alaknanda, the ensuing flash floods too had caused untold misery. Again, in September 2010, devastating floods and landslides played havoc both in Garhwal and Kumaon regions and in the Bageshwar district alone, 18 children were killed and more than 30 children were trapped in the rubble of a school building. Two years ago, the pilgrim routes from Rishikesh to Badrinath and from Rishikesh-Gangotri road were badly hit, threatening the lives of thousands of pilgrims. Let's hope and pray that your uncle and aunt are both safe.

Let us also pray for the safety of all those who are affected," said her mother.

"But Mama, are you sure Tom uncle and Mary Aunty are in Chamoli at this time? They usually like to go on pilgrimage every mid-June," asked Rohini.

"Yes, they do, and as luck would have it, today is 16th June and we are already in the middle of June 2013. I'm not sure whether they are in Chamoli or not, but I'm certain, however, that they are somewhere in Uttarakhand. When I spoke to them a week ago, they told me that this time they were planning to go on a pilgrimage to the shrines of Kedarnath and Badrinath," replied her mother.

Even before her mother could ask, Rohini was already trying to ring her aunt to check whether everything was okay out there, but the telephone did not connect despite repeated attempts perhaps because of breakdown of the communication system. In the meantime, she heard breaking news on BBC that the fate of thousands of pilgrims in Uttarakhand hangs in balance as the situation is rapidly sliding down from bad to worse. The ground literally moved beneath her feet when she heard that the shrine of Kedarnath was among some of the worst hit locations.

Rohini: We feel helpless. What can we do for them sitting here hundreds of kilometers away?

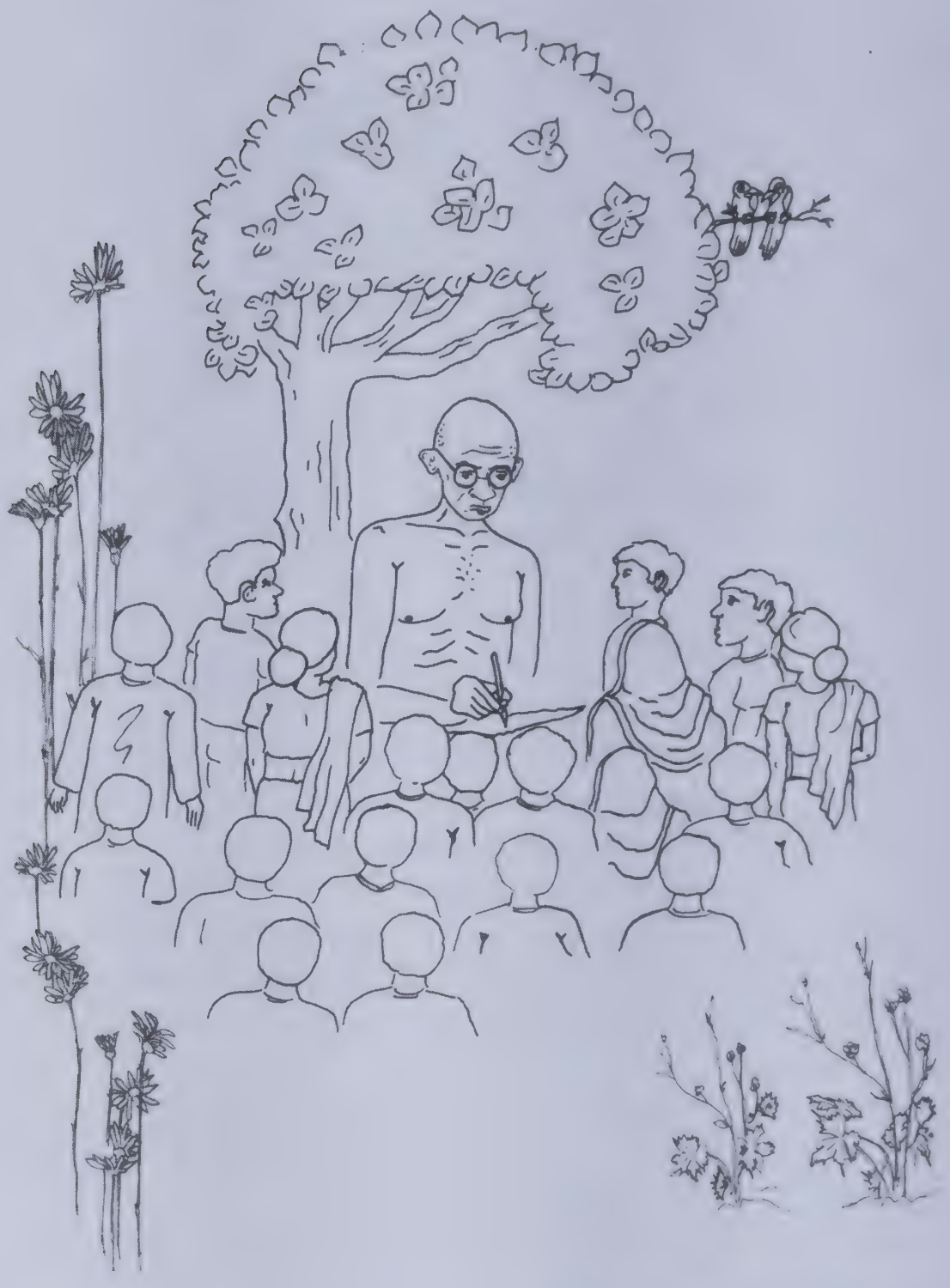
Mother: You remain tuned to the Uttarakhand news my dear and, in the meantime, I will try to locate your uncle and aunt through the government helpline and a television news anchor I personally know.

Rohini: One of my classmates who once passed through the hell of an earthquake disaster had told me that helplines are not usually prepared to answer such specific questions. I think we better pray for their lives, Mama, without wasting any time on making enquiries. Disasters are an act of God, after all! I've recently read Raman Maharshi who has said, "Whatever is destined not to happen will not happen, try as

"But Mama, I've learnt from none other than the teachings of Mahatma Gandhi that disasters are an act of God. Surely it must be true. The whole world knows that Gandhiji never told lies!"

you may. Whatever is destined to happen will happen, do what you may to prevent it. This is certain. The best course, therefore, is to remain silent and pray."

Mother: Pray we must, my dear, but who told you that disasters are an act of God? Know this that disasters occur chiefly because of reckless human violence against Nature. In Uttarakhand, disasters are the consequence of mindless urbanisation, illegal mining, environment unfriendly hydroelectric projects, dams, roads, buildings and bridges



"For me, personally, this earthquake has a much deeper lesson than that it has brought physical ruin to thousands of homes. It is my firm conviction that such calamities descend upon mankind from time to time as a fit punishment for its sins," said Mahatma Gandhi.

and many such factors. And no one seems to know the way Climate Change is playing out to add fuel to the fire. In our age of science, it is important that we completely free our minds from such outmoded views and myths.

"But Mama, I've learnt from none other than the teachings of Mahatma Gandhi that disasters are an act of God. Surely it must be true. The whole world knows that Gandhiji never told lies! Just wait a second, the book is right here on my bookshelf and I have even flagged the page. Let me straight away read out to you what Gandhiji said when he saw the heart-rending plight of victims of the Bihar-Nepal earthquake of 15th January 1934.

"For me, personally, this earthquake has a much deeper lesson than that it has brought physical ruin to thousands of homes. It is my firm conviction that such calamities descend upon mankind from time to time as a fit punishment for its sins."

The earthquake had killed nearly 7253 people. Thousands of buildings were razed to the ground, especially at Sitamarhi, Rajnagar, and Darbhanga. At many locations, the earthquake shock liquefied the ground and made it flow like a slurry on which many of the structures were found floating. In Jharia, the earthquake triggered a huge underground fire. Deeply saddened by all this, Gandhiji repeated his views at a public meeting of nearly 25000 people in Tuticorin on 24th January 1934:

"Let us derive the lesson from this calamity that this earthly existence is no more permanent than that of the moths we see every night dancing around light for a few minutes and then being destroyed. This earthly existence of ours is more brittle than the glass bangles that ladies wear. You can keep glass bangles for thousands of years if you treasure them in a chest and let them remain untouched. But this earthly existence is so fickle that it may be wiped out in the twinkling of an eye. Therefore, whilst we may have yet breathing time, let us get rid of the distinction of high and

low, purify our hearts, and be ready to face our Maker when an earthquake or some other natural calamity or death in the ordinary course overtakes us."

Mama: "Look Rohini, I too respect Gandhiji, perhaps more than you do, but I insist that you must appreciate the need to develop a thinking of your own. Alongside Gandhiji, why not read Gautam Buddha also whom we both worship? According to the Buddha, "Do not believe in anything simply because you have heard it. Do not believe in anything simply because it is spoken and rumoured by many. Do not believe in anything simply because it is found written in your religious books. Do not believe in anything merely on the authority of your teachers and elders. Do not believe in traditions because they have been handed down for many generations. But after observation and analysis, when you find that anything agrees with reason and is conducive to the good and benefit of one and all, then accept it and live up to it."

Rohini: Indeed, it is a great message, Mama. It has really opened my eyes. I 'm on the same page as you are, but would you please also tell me why none of the contemporary intellectuals and thinkers of that time had the courage to challenge Gandhijis's view on the connection between disasters and the Divine?

Mama: I'm glad you have raised this million dollar question. The great Indian poet Rabindranath Tagore and the first Indian Prime Minister Jawaharlal Nehru both had vehemently opposed Gandhiji, completely rejecting his view. Let me see if I could trace for you the relevant book in this very bookshelf.

Yes, it is here. Read this passage from Rabindranath Tagore aloud:

"I could see no connection between the earthquake and ethical failure. It is all the more unfortunate because this kind of unscientific view of natural phenomena is too readily accepted by a large section of our countrymen."

"That's pretty clear, Mama," admitted Rohini.

Mama: Not only this, for the same earthquake, look here, this is what Prime Minister Jawahar Lal Nehru had to say:

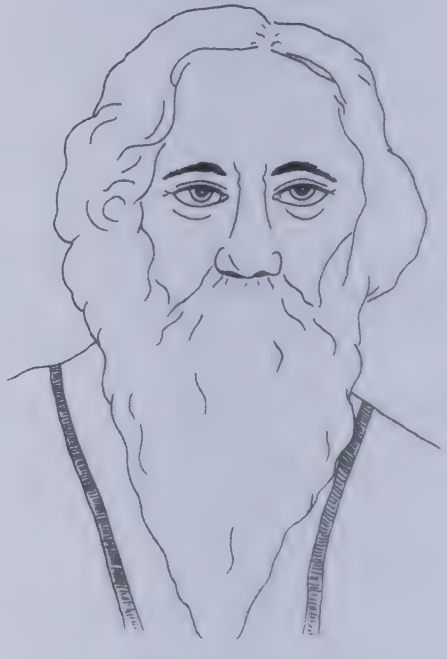
"If the earthquake was a divine punishment for sin, how are we to discover for which sin we are being punished? Why did not the earthquake visit the land of untouchability itself? Was it a judgment on the prevailing zamindari system since many rich land owners had suffered losses in the earthquake? Could the British rulers interpret it as a divine punishment because Bihar had been taking a leading role in the freedom movement?" Since Nehru did not attempt to answer these questions himself, it is obvious that he had raised the questions just to oppose Gandhi's flawed logic. Nehru found it astounding that human customs could cause movements in the Earth's crust.

Just as she had finished reading Nehru's quote, Rohini saw her mother already talking to someone over the telephone. It was Rohini's Uncle in Uttarkashi who had called. Obviously he was safe and at long last, had his phone working.

A smile returned to Rohini's face when her mother confirmed that both of them were indeed safe, although hundreds had perished and thousands were stranded at several locations. Because of the heavy rains, flooding and landsliding, life in Uttarakhand had come to a grinding halt.

Rohini's mother thanked God, hung the phone and gave Rohini the good news that her uncle and aunt were safe because of last minute postponement of the planned pilgrimage to Kedarnath following the severe bad weather alert. Heavy rain, thunder, lightning and flash floods seemed to continue even now.

"What a great news, Mama, that both of them are safe. But please tell me why you did not think of me also to talk to them? Moreover, why do you always like to thank God for all the good things that happen,



Pandit Jawaharlal Nehru and Rabindranath Tagore looked on the otherside of Gandhiji. They both opposed the view of Gandhiji on the Bihar-Nepal earthquake of 1934. Rabindranath Tagore wrote: "I could see no connection between the earthquake and ethical failure. It is all the more unfortunate because this kind of unscientific view of natural phenomena is too readily accepted by a large section of our countrymen."

whereas you never blame Him ever for a single bad news?" questioned Rohini.

Mama: In times of crisis, we should never talk too long over the telephone and load the telephone line, as a matter of consideration for others. Now, since there is no emergency, you can always call them later when quiet returns.

As regards your second question, personally I thank God for everything, and practice everyday to accept both the good and the bad in life as they come. We should thank God for giving us beautiful mountains, pristine rivers, dense forests, fauna and flora, as also for giving us insatiable hunger for truth. Think hard and you will yourself stop blaming God the moment you begin to realise that the situations we suffer from are of our own making. It is spirituality in life which gives us strength to face situations of crisis with fortitude and courage. It was Buddha who said, "Just as a candle cannot burn without fire, men cannot live without a spiritual life." We should have equal faith in Him and in the irrefutable laws of Science. The two are not different at all.

Rohini: Mama, where then is the difficulty in convincing people so that they begin to look at things as they are, objectively and not emotionally?

Mama: There are not one, but several difficulties, my dear. Most of us are overwhelmed by the humdrum of day to day problems we face and that leaves very little time for us to think, and even lesser time to act. Disasters invariably bring untold misery, death and destruction that we all hugely fear. While in the grip of fear, most of us lose our cool and composure. Therefore, those who survive a disaster invariably attribute their survival to the so-called divine intervention. When dealing with questions of life and death, it is easier to market faith than to market science. To be frank with you, faith in science is the hardest thing to sell and therefore faith in the supernatural tends to frequently over-run science. Let me tell you a story:

Dr Emmanuel Heath, the Rector of the Port Royal of Jamaica and John White, the President of the Island's Council were among the two exceptional survivors[1] of the Port Royal earthquake of 7th June 1692 in Jamaica in the West Indies. They somehow escaped death in a situation in which nearly two-thirds of the landmass sank into the Caribbean Sea. The earthquake, then triggered a tsunami and the death toll rose to about 5000 people. Heath and White, while chatting, suddenly experienced rolling and moving of the floor. A startled Heath asked White, "Lord, Sir, what's this?"

White, very coolly replied, "It is an earthquake, be not afraid, it will be soon over".

On the contrary, the shaking rapidly worsened. When they heard the Church and Tower fall, the two men fled to the tavern. It was taken as God delivering a just punishment to sinful people… it was regarded as God's chastisement for sin or as a portent of greater punishment to come.

"By this terrible judgment, God will make them reform their lives, for there was not a more ungodly people on the face of Earth," said Heath.

Similar was the reaction of William Bradford, Plymouth Colony Governor, to a New England earthquake. "I see the event as God displaying the signs of displeasure for a wayward people," observed Bradford.

By the way, Rohini, have you heard of John Wesley?

No Mama! Who is this gentleman and why is he important at this time?

Mama: John Wesley was an Anglican cleric and a noted Christian theologian of the seventeenth century and I remember him now because of his out of the box thinking. This is how he responded to an earthquake:

"It comes! The roof trembles! The beam cracks! The ground rocks to and fro! Hoarse thunder resounds from the bowels of the Earth! And all these are but the beginning of

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1 The Port Royal Earthquake—History Today, Larry Gragg (2000).

sorrows. Now what help? What wisdom can prevent? What strength can resist the blow? What money can purchase, I will not say deliverance, but an hour's reprieve? Poor honourable Fool, where is now thy golden God? If anything can help, it must be prayer. But what wilt thou pray to? Not the God of Heaven: you suppose Him to have nothing to do with earthquakes?"

Rohini: I see naughty sarcasm in Wesley's words. But he certainly makes me think harder and deeper. I too have read about the epics, mythological stories and captivating legends tending to convey that disasters are punishment of God to mankind for the sins committed, but frankly I always stopped short of getting into the depth of these myths and beliefs which, now I think we must discard. Can you cite a few examples?

Mama: There is no dearth of examples, my dear. The other day I was at the entrance of the western observatory of Boston College and by the side of the statue of Virgin Mary, I read the message: "He looks over the Earth, and it trembles", engraved.

Rohini: But Mama, this is what the Bible also says.

Mama: Yes, you are absolutely right. The Bible said it first and it is only thereafter that the message got engraved in the minds of millions of people across the globe who would never question the Bible. As though this was not enough, the Boston Puritan Mather had also declared, "There never happens an earthquake, but God speaks to men *(and women)* on Earth."

Rohini: Are there such myths for other types of disasters as well, such as, for example, volcanoes and lightning?

Mama: Of course, yes. Romans believed that volcanoes occurred because of the hammering and forging works taking place within his deep underground forge factory in the womb of Mother Earth. In Indian mythology men regarded lightning as one of the mighty weapons of Lord Indra, the rain God. Early Greeks believed that lightning was the creation

of Greek God Zeus. Scandinavian mythology believed that God Thor thundered with lightning to silence his enemies. The holy Quran of Muslims, says, "He it is who showed you lightning and launche the thunderbolts." African tribesmen saw lightning as the act of their Bird-God.

Similarly, for a long time people in Europe believed that avalanches were the doing of evil spirits; to them, "The avalanche was what flies without wings, strikes without hands and sees without eyes—the avalanche beast."

"What is being done to eradicate such myths?" asked Rohini.

By now, science has thrown enough light on the real reasons behind the occurrences of disasters and the various myths are gradually getting rejected by educated societies. Obviously there are delays in chasing out myths because we have done precious little so far to spread scientific truth, inculcate scientific temper and benefit from scientific findings. We have not done enough even to make people aware of findings affecting our personal safety. For instance, it took the genius of Benjamin Franklin to uncover myths about lightning, but even centuries after knowing the harm lightning strike could cause, many of our tall buildings still do not have lightning conductors. Once again, I quote Buddha who said, "There are only two mistakes one can make along the road to truth; not going all the way, and not starting." We have not even started. This generation has failed, but your generation must work much harder to make things happen.

Rohini: Sure, but what can be done?

Mama: We can do three things: First, learn to feel the need as well as the joy of truth seeking change; second, be determined to bring the change in spite of the resistance to change and third, stop not till the goal is reached. You must have heard the saying that one can take a horse to the pond, but cannot make it drink. Similarly, no amount of speeches and announcements by our leaders can convince people of the

truth unless they feel the need themselves. Max Planck once said, "A scientific truth does not triumph by convincing its opponents and making them see the light, but rather because its opponents eventually die and a new generation grows up that is familiar with it".

Mama (continued): To unearth the truth, we need scientific temper, relentless scientific studies and endless patience. Science of disasters has no sympathy with restless minds and their well known hate for in-depth thinking. Our bad habit of making off-the-cuff statements without testing their veracity, makes matters even worse. We may temporarily get away with subjective statements and that may even take away the heat of the moment, but the reprieve will mean no more than the lull before the next storm.

Rohini: So what is the central message?

Mama: Disasters are our own making for which we must own full responsibility and do our bit, singly and collectively, rather than merely labeling disasters as an act of God, and do nothing. Let us leave the question of what God does or what God does not do to the philosophers and theologists. I'm reminded of the following words Mother Teresa uttered while passing through a period of suffering in 1996:

"I do not know what God is doing, He knows. We do not understand. But one thing I 'm sure. He doesn't make a mistake."

Rohini: I feel very excited to continue thinking and make a new beginning. Shall we go to Uttarakhand to see the disaster at its peak, talk to the victims and learn?

Mama: Of course, dear, that's the best way to learn. We should, however, wait until the dust settles. Let's not crowd there to add to the burden of disaster managers.

Rohini: Thank you Mama. I now clearly see disasters differently. Men should own the responsibility for violence against Nature rather than blaming God.

Mama: Why exclude women and the third gender?

2

A SPECTACLE OF DISASTERS IN THE THEATRE OF GOD

"There are two types of people in this world — those who have seen the Taj Mahal and those who have not," quipped the American President Bill Clinton in one of his conversations during his first visit to India. The world is similarly divided vertically when it debates the question— Does God play dice with the universe? Those who disagree include Albert Einstein, well known for his work on quantum mechanics in which particles appear random to an observer. Those who agree may be lesser mortals, but they certainly outweigh the number of those who disagree primarily because people at large do not have even the foggiest idea of how our universe works!

This true story takes Tom, Dick and Harry, or any three of you, straight to the theatre of God in Japan, for eyewitnessing the play of God's dice so as to form your own opinions. Look at the calendar. The date is 1st September 1923.

Tom, Dick and Harry chose God's theatre in Tokyo, although they also had the option to go to Yokohama, Chiba, Kanagawa and Shizuoka without any loss of view of the play, about to begin. The theatre in Tokyo, in which the three of them were seated, was called to order at 11:50 a.m., a few minutes before the start of the play. With the third eye, they saw that it was the time when most people of Tokyo were preparing for lunch using fuel-wood-stoves.

Does God play dice with the universe? Planet Earth is hotting up and is virtually aflame. How long will we continue to debate the issue, blame God and shirk our collective responsibility?

Just when the clock struck fifty-eight minutes past eleven in the morning, Tom, Dick and Harry felt the main shock of a mighty earthquake. Since the theatre was laced with the ultimate in technology, they could clearly see Kanto, the

Before the earthquake of 1st September 1923 struck Tokyo, most people were preparing for lunch using fuel- wood-stoves. At the very first earthquake shock, the stoves flew like match sticks unleashing a tirade of all types of disasters one after the other.

location of the earthquake, in real time. The accelerometer repeatedly flashed the earthquake magnitude 8.2 on its accelerogram. Within seconds of the earthquake, they saw the entire population of Tokyo in panic as the cooking stoves began to tumble and clash with one another, as if they were part of a stampede. Entire Tokyo was aflame. Within minutes, small fires, seen here and there, all joined hands and towering infernos began to fan out virtually in all directions.

Tom: Look here you guys, Don't be mistaken. It is not only the city of Tokyo but the fire is also rapidly spreading towards the cities of Yokohama, Chiba, Kanagawa and Shizuoka.

Dick: Oh yeah. And look at those fiery winds off the coast of Noto Peninsula in the Northern parts of Japan. Surely I already see them developing into a severe typhoon to further stoke the fires.

Harry: I see much more than you guys do. There are no small fires any more; there are big fires everywhere and though our theatre is fully insulated and safe, I feel the heat. Mark my words, the death toll will be phenomenal. After all, this a replay for us of the Great Tokyo fire of 1923, the biggest ever.

Tom: Not only that. We had heard of earthquakes, fires and tornadoes striking separately, but never heard of such an unholy click between the earthquake, the fire and the typhoon.

Dick: My God, what an after-shock this is? I now see much more to this than what meets the eye. It seems the worst is still to come. Oh yes, look at those landslides and rock falls so fiercely moving into the coastal areas of the Kanagawa Prefecture. I believe God is playing dice, or how else could we explain earthquake fires, typhoon, landslides and rockfalls occurring one after the other in a manner that foxes all imagination.

Tom: It seems the game of the dice is far from over, it is picking up. Look there, that violent tsunami is developing

Within seconds of the earthquake, stoves began to topple and looked like an army of fiery matchsticks, hell bent to put entire Japan aflame. Small fires, here and there, joined hands and were seen to emerge as towering infernos spreading in all directions. The tragedies that followed are without parallel in human history.

in the epicentral region, rapidly adding to its height and mercilessly hitting the coast of Boso and Izu peninsula, and Sugami Bay.

Dick: I guess the tsunami is about 10m high.

Harry: To me it seems slightly less, but variation of a couple of meters this way or that way will still be as bad.

Tom: Here is breaking news: Nearly 2 million people have become homeless, the total death toll has risen to 1,42,800 and nearly 3,50,000 homes have been destroyed in Tokyo alone. Nearly 90% homes have been destroyed in Yokohama.

Dick: Let us find out the death toll because of fire alone.

Tom: It is a disaster caused by an interplay of multiple factors and therefore it will be inappropriate to link deaths to a single cause. But at Rikugun, Honjo and Hifukusho in Tokyo, as many as 38,000 people have died mainly because of the fire. I've just come to know that nearly 800 people were killed by landslides. I myself saw one of the landslides hitting the stationary train at Nebukawa, killing 100 passengers.

Dick: And the tsunami has killed an additional of about 100 people.

Tom: You were right Dick when you said that the play of dice is still on and picking up. I believe the worst has not yet come. Look at those thousands of people out there in the grip of panic spreading rumours, shaken by the earthquake, fires, typhoon, tsunami and landslides.

Harry: What kind of rumours?

Dick: I hear rumours spreading all over that the lifeline drinking water wells have been poisoned by the Korean immigrants. The other rumour, especially in Tokyo is that Koreans are also engaged in post-disaster lootings. I clearly see the smokescreen of confusion at its elemental worst.

Harry: Oh dear, the situation has really turned so violent that the Government has just clamped Martial Law.

Tom: According to the breaking news, as many as 6000

Koreans have already been slaughtered and yet the rumours and ethnic mistrust seem to continue unabated.

Suddenly the curtains fell and the horror show was over.

Tom, Dick and Harry left the theatre of God totally perplexed and puzzled. Tom broke the silence by saying that such a spectacle of disaster cannot be without God himself playing the dice. How else could one explain earthquake, fire, typhoon, landslide and tsunami all running a curious relay race?

Dick nodded unknowingly, but he was lost deep in thoughts. He himself was a student of physics and recalled his lessons in quantum mechanics and black holes. None other than Stephen Hawking was of the view, "Not only does God play dice with the universe, he throws them where they cannot be seen."

Harry: So does God play dice with the universe?

Dick recalled and repeated the following advice of Neil Bohr to Einstein: "Don't tell God what to do," and then he asked Tom and Harry to keep thinking till the cows come home!

3

CRISIS WEARS DIFFERENT UNIFORMS

Amol (a student): But, excuse me, Ma'am, I'm still very confused about the hair-splitting differences between terms like threat, danger, hazard, disaster, calamity and catastrophe. Can you please explain these terms one by one?

Teacher: The confusion is natural because most of these terms are fungible[1] in a casual conversation. They are all to be regarded as crisis in different uniforms.

We often use terms like threat, danger, hazard, disaster, calamity and catastrophe in real life situations without realising what these terms really mean and what will be the implications of their inappropriate use. We speak of natural and man-made disasters also without really knowing how to distinguish between the two. It is for all of us to use these terms not interchangeably but responsibly. Always remember that the biggest problem in achieving effective communication between various actors is partly ignorance and partly careless use of terminology.

Ishita: So, what is meant by threat?

Teacher: Threat is the state of being exposed to some harm, injury or damage. It is also a source of danger. For example, a poisonous cobra is a threat to those who work in a forest.

Ishita: That is pretty clear. But then what is meant by a hazard?

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1 Often interchangeable.

Teacher: The term hazard means a possible source of a potentially dangerous event. For example, earthquakes, volcanoes, hurricanes and avalanches are all sources of potentially dangerous events which is why we call them natural hazards.

Amol: I get it now, but I still do not feel the difference between a hazard and a disaster.

Ishita: When hazards kill people they are called disasters. Am I right, Ma'am?

Teacher: You are nearly right, but it is not only loss of life, disasters also destroy our homes, damage our roads and bridges, wash away agriculture crops and disrupt life in many ways. The term Disaster is a Latin word which literally means ill-starred. It is made of two words, namely, *Dis* and *astrum*. Dis means without and astrum means star. The term itself stands for all calamitous events producing material damage, loss and distress.

Rohan: Last time when an earthquake struck Kashmir and killed thousands, my Mom called it a Calamity. Is a calamity the same as a disaster?

Teacher: It is not very easy to distinguish between the two. Calamity means an extraordinarily grave event causing misery, misfortune, grievous affliction, adversity, great loss and leaving behind a trail of lasting distress, emotional outbursts, affliction and grief. The pain inflicted by a calamity is more from personal or general grief and sorrow rather than from other causes.

Rohan: Then how is a catastrophe different?

Teacher: The term catastrophe finds its origin in the Greek word, Kata streiphen in which Kata means down, and streiphen, means turning over. Catastrophe, therefore, means an irrevocable tragedy which goes beyond disaster or calamity. Catastrophes are events which affect systems.

Amol: Are Catastrophic and Cataclysmic events the same?

Teacher: Cataclysm is the term used to describe an overwhelming event climaxing in the upheaval and destruction of an established system. Unlike the use of word calamity, the term cataclysm is used in the context of general or universal happenings rather than personal happenings.

Ishita: Whether it is a disaster or a catastrophe, we eventually end up in a crisis. What does the term crisis really mean other than mere disorder?

Teacher: The word *crisis* is of Greek origin, meaning a point of instant impending change, one-way or another. The Chinese word for crisis is made of the ideograms *disaster* and *opportunity*.

Ishita: Is the term Emergency any different from Crisis?

Teacher: The word emergency is a hybrid of the words emerge and urgency. The word emerge is the opposite of the word merge. An emergency represents a sudden departure from the normal and the familiar. It is the opposite of normalcy.

Amol: My mummy says that in times of crisis, one must not spread rumours and create panic. What do we mean by rumours and panic?

Teacher: I call rumours and panic as two naughty offsprings of a disaster. In times of crisis, right information does not reach affected people at the right time. This leads to speculations of all sorts. People begin to read between the lines and cook up stories which we call rumours. Rumour, of all evils, is the swiftest.

Ishita: And what is meant by the term Panic?

Teacher: What you are doing now is exactly what people in a panic do. They have no patience to wait and listen. The word *Panic* came from Pan, the Greek God, traced to Greek mythology. Pan, had the torso of a human and horns, legs and beard of a goat. He routinely roamed in the forests and meadows and played on the flute in daylight. Under the cover of night, he spent his time in the conquest of nymphs

and played tricks on travellers. As the story goes, Pan made strange sounds to terrify people passing through the wilderness of the mountainous terrain, forcing them to run for their lives. The fear which made people run was termed Panic.

Ishita: Can we learn all this in the form of a story?

Teacher: In a coastal town, not very far from the capital city of Chennai, in the State of Tamil Nadu in India, there lived a fisherman by the name of Ramoo with his wife Soma and his son Chhotu. The father and son frequently sailed into the sea for fishing, with their little boat. It was the month of October and Ramoo well knew that it was the season of severe tropical cyclones, a much feared natural hazard. In fact their entire community felt threatened in the cyclone season because of the threat and danger to their lives and livelihood.

Once on a rainy day, without caring for the bad weather, Ramoo set out for fishing with his son Chhotu, and when they were hardly a few kilometers away from the sea shore fierce winds began to rock his boat. Being directly exposed to winds, he became conscious of the threat. Sensing the grave danger of getting drowned, he at once switched on his radio for the weather news. Yes, the radio was already warning all fishermen to stay away from the turbulent sea. Ramoo realised his folly of not listening to the radio warning prior to leaving the coast. It was too late for him to return to the coast now because a tornado had already struck the coast.

Within a few minutes, the boat was caught in the swelling waves and both Ramoo and Chhotu were thrown apart, high into the sky. Ramoo was old, frail and not good at swimming and therefore he was swallowed by the sea within seconds. Chhotu was not only young but a tough swimmer. He battled hard for hours and swam to the shore in safety. Upon returning, he found very little damage on the coast. Naturally the tornado, on that day, was not in a

mood to destroy. Even then his father was killed and Soma became a widow.

Nivan: I would call it a disaster.

Teacher: Indeed, you may perhaps call it a disaster in so far as Chhotu's family is concerned, because Soma lost her husband, Chhotu lost his father and the family lost the only source of livelihood — namely the boat. Even then, because no other damages were reported from any other part of the town, it may not be appropriate to call it a disaster. This incidence can be best described as a grave family tragedy caused by a deadly accident. However, if the tornado would have left behind, all round destruction, death and deluge, then we could have certainly called the event a disaster.

Ishita: Please continue with the story.

Teacher: Life for the family came back to normal. Chhotu continued to earn his livelihood by fishing for which he hired a boat as he could not afford to buy a boat of his own. As years rolled by, he became a highly accomplished fisherman. He had learned lessons from the personal tragedy and before sailing into the sea, he always listened to the radio and carefully followed the alerts. In this way, he could many times avert threats due to storm surges, cyclones and tornadoes. Unlike him, those who did not follow the early warning alerts were very often found to be victims of extreme weather events.

Cost of living increased and a time came when Chhotu could not earn enough to even hire a boat. He and his son Motta therefore took to onshore fishing. On 26th December 2004, in the early hours of the morning, they saw coastal waters receding fast into the sea. Nobody had ever told them that receding sea waters are the sure sign of an incoming tsunami. A few minutes later, he saw a giant sea wave approaching the coast. Sensing danger, Chhotu started running away from the coast to save his life and expected his son to follow him. When he looked behind for his son,

How many of you now understand the terms damage, hazard, tragedy, disaster, calamity and catastrophe? Was Amol right in explaining these terms to you all?

he could not find him and instead saw a giant sea wave fiercely chasing him like a ghost. Chhotu, clever as he was, did not take much time to realise that he was facing no-ordinary- sea-wave, but a killer wave, the like of which he had never seen before. He had the survival instinct and a great presence of mind. Realising that there is no escape to safety within sight, he ran towards the nearest robust looking tall tree, and climbed as high as he could. The wave lashed the tree repeatedly. Soon he realised that providence had placed him in the front seat of the theatre of nature as if to watch what he later came to know was a tsunami in action. He saw waves pounding the shore, one after the other, each one getting bigger than before. After about three hours of high drama, he found himself surrounded by sea water all around. It was getting dark but he did not lose hope. As luck would have it, he suddenly heard the noise of a rescue helicopter flying overhead. He was spotted out, rescued and sent to a makeshift kind of hospital in a relief camp, where he slowly recovered.

While recovering on the hospital bed, he came to know that the tsunami was very big and had ravaged the entire town. Reportedly hundreds of people were killed and thousands became homeless. The survivors had no food or clothing. Dead bodies had piled up awaiting mass funeral. He also came to know that the tsunami had affected not only his family (as he had lost his mother and son) but had brought ruin to coastal areas in several other countries as well. The tragedy acquired a truly global dimension.

Raina: I guess it was a very big disaster, a catastrophe.

Teacher: Yes indeed. Can anyone of you tell me what you all have learned?

Amol: I now clearly see crisis dressed in different uniforms. Let me explain. Suppose an earthquake comes here and now and if we all survive and no damage is done, there is no problem. If one of us is killed, it is a personal tragedy

and loss to the school. If none of us were to survive, then it would be a tragedy for the school and for the country and a calamity for the family. If the earthquake caused widespread damage and killed many more people in the town and in other parts of the region, it would be known as a disaster.

Now it remains for me to define Catastrophe. If that very earthquake not only results in huge damages and loss of life, but also causes widespread misery, destroys our schools, police stations, hospitals, railway stations, roads, bridges, airports, buildings, and years of development, it will be called a catastrophe that the whole world will know. The Indian Ocean tsunami of December 2004 is an example.

Am I right Ma'am?

Teacher: Of course, yes, Amol!

4

FIERY VOLCANOES AND FIRED MINDS

One thing in common between the volcanoes and human beings is fire in the belly. Both are moody. The mood of a volcano swings from a tranquil countenance to the deadliest of outbursts, both without parallel in human imagination. The mood of human beings, on the other hand, swings from the worst of fears to limitless curiosity and courage, especially when against odds.

A couple of years ago, I happened to read the article 'When volcanoes turn deadly for those studying its moods' published by William J. Broad in the New York Times of February 9, 1993. It is about one of the most active of Colombian volcanoes by the name of Galeras which had bouts of major eruptions in 1936 and 1945, not to speak of numerous minor bursts. To many, the long period of silence of Galeras seemed akin to lull usually found before a severe storm. Fearing the long silence of Galeras as an indicator of its imminent recurrence, it captured the attention of the United Nations. About 90 scientists from 15 countries met at a conference in Pasto, Colombia under the banner of the UN to investigate the mysteries of Galeras.

Dr. Stanley N. Williams, a young volcanologist of Arizona State University, led the American contingent to Pasto, about 600 kilometers southwest of Bogota in the Andes near Ecuador. The place is located at the foot of the volcano's eastern slope, a few miles away from the crater and had a

population of 400,000 at that time. The mission of the meeting was to find better ways of predicting volcanic eruptions through a face to face, aggressive, field study, which began on 14th January 1993.

Scientific curiosity drove Williams to the crater's eastern rim and two of his colleague's went closest to the mouth of the volcanic crater to look directly into it. Three others were daring enough to reach the opposite side of the rim. Some other members left the site after making investigations of their own.

What followed soon after, is truly stunning and bizarre. The volcano which was fast asleep (dormant) for decades suddenly woke up (erupted) with a roar, as if to salute the team that dared to stare in its face. And indeed the welcome was so exceptional that the mood of the volcano suddenly swung from one extreme of perfect silence to the other extreme of mind boggling violence.

Galeras exploded with full force so much so that the deafening noise of its successive bursts of violence took everyone by surprise. It started spitting volcanic ash and shooting boulders to great heights, creating a spectacle hard to describe. The team members ran helter-skelter as the ground slid beneath their feet. Williams could see his colleagues badly trapped right at the edge of the crater, visibly sliding into the jaws of death. The only challenge for him was to run as fast as possible to escape death. Hardly could he have run about 20m from the rim of the crater that the shooting boulders and the rapidly flowing volcanic ash first began to chase and then overtake him. No matter how bravely he tried to keep his balance, severe skull and leg injuries made him even more vulnerable. The volcano which could not break his courage instead succeeded in breaking his leg so that he could run no more. Even then, with an exceptional presence of mind, he could dodge the volcanic onslaught by using the nearby massive rock as a shield.

The volcano which was asleep (dormant) suddenly woke up as though to welcome the team of daring scientists. And indeed the welcome was exceptional as the mood of the volcano suddenly swung from perfect silence to mind boggling violence.Who knew at that time that the conference would be remembered in history more for the horror story spewed by Galeras rather than for insatiable human curiosity?

Clearly, providence had wanted him to survive the ordeal so as to be able to tell the whole story, as it is, to the rest of the world. He was eventually rescued by his graduate student Marta Lucia Calvache, and another woman and removed on a stretcher, later flown by a helicopter to a hospital in Pasto, and subsequently transferred to the hospital in Phoenix. William eventually survived.

His six colleagues were buried under the pile of debris, but not without setting an example of courage and curiosity for others to emulate. Dr Stanley N. Williams, the surviving hero, although shaken by the death of his colleagues, got ready to go back to Galeras to continue with his mission.

It is stories such as this one which make Volcanology a high curiosity, high-risk profession. It also tells us that high risk can dent curiosity of a volcanologist for a while but cannot bend his will. Although this battle of Galeras was lost, surely, one day, the volcanologists will win the war, howsoever long drawn it may be. Until then Galeras will continue to have the last laugh!

Who could ever imagine that the conference at Galeras would be remembered in history for the pitch dark color of the horror story it spewed as much as for the heroic story of those who dared Galeras in its own den with their matchless courage to uncover the truth concealed in the womb of Mother Earth.

5

THUNDER AND LIGHTNING

Amol and Ishita were strolling in the garden of a public park when it suddenly started raining with thunder and lightning. Ishita asked Amol whether he knew that lightening struck the Empire State Building in New York 15 times in 15 minutes?

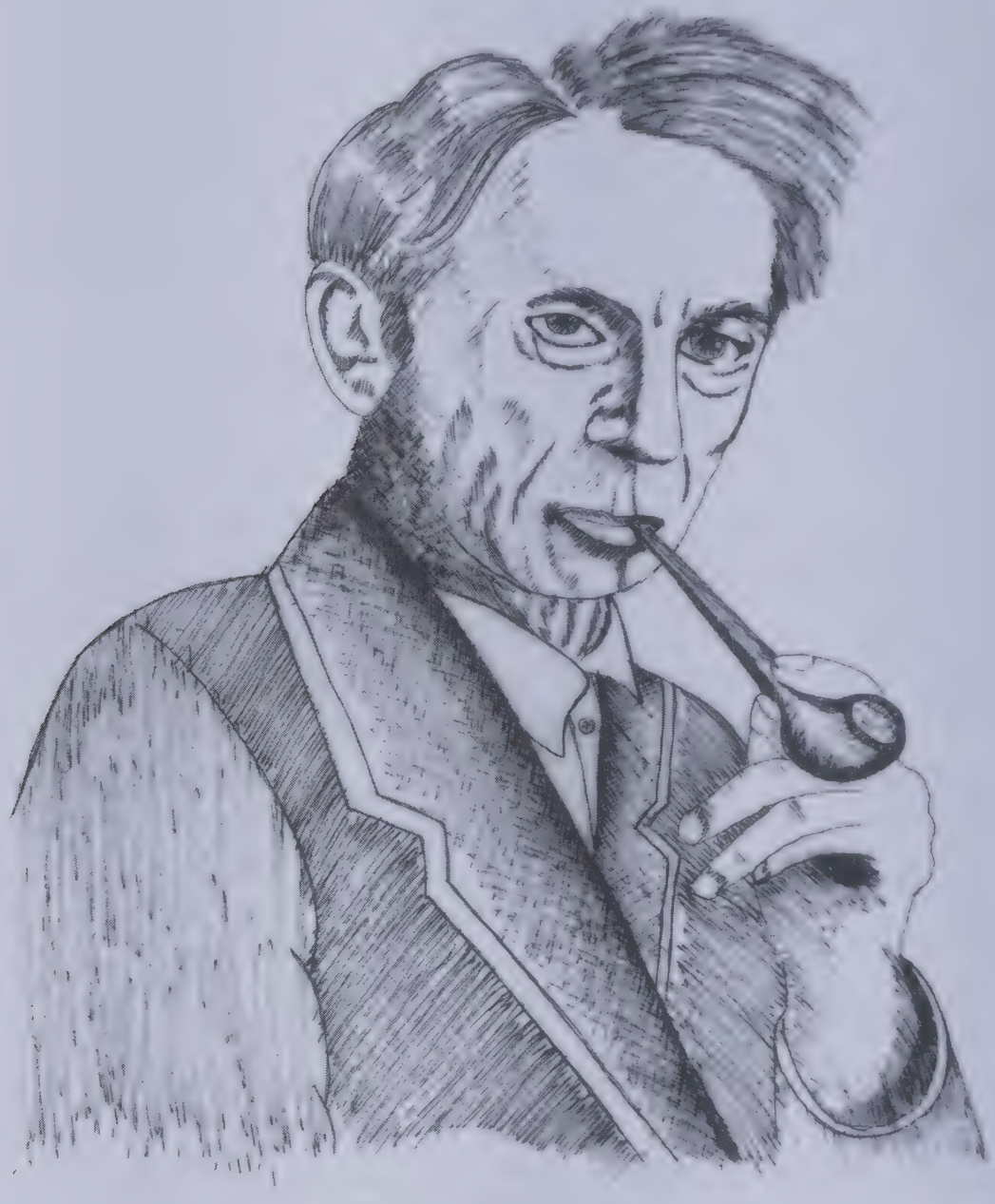
Amol: Come on, give me a break. You should know that lightning does not strike the same spot twice! Yeah. Your knowledge is as stale as last week's bread. Try to learn from nearly one hundred lightning strikes which occur every second and about 1800 thunderstorms which are in the making whenever you start thinking of them. So if you really want to learn, don't be swayed away by unscientific thoughts, called Intellectual Rubbish by Bertrand Russell.

Ishita: You sound very knowledgeable. Where did you read all this? What else do you know about lightning?

Amol: My teacher taught me that lightning bolts can travel at about 14,000mph bringing down 300,000V of electricity in just a few milliseconds. The heat so released can raise air temperatures to 30,000°C, a whopping five times higher than the surface of the Sun! It can travel upto distance of about 60 miles, especially when in the squall line of a storm.

Ishita: It is scary indeed. Okay brother, but I've one more doubt before we rush indoors. We saw the lightning first and heard the sound of thunder afterwards. Why is it so?

Amol: Simple. Light travels at 186,000 miles in a second, almost a million times faster than the speed of sound, whereas



Bertrand Russell
1872-1970

"When Benjamin Franklin invented the lightning-rod, the clergy, both in England and America, with the enthusiastic support of George III, condemned it as an impious attempt to defeat the will of God. For, as all right-thinking people were aware, lightning is sent by God to punish impiety or some other grave sin—the virtuous are never struck by lightning. Therefore if God wants to strike any one, Benjamin Franklin [and his lightening-rod] ought not to defeat His design; indeed, to do so is helping criminals to escape."

- Bertrand Russell
In An Outline of the Intellectual Rubbish (1943)

sound travels at a much lower speed of one-fifth of a mile in the same time. This is the reason that we see lightning first and hear the sound of thunder afterwards, although they both occur essentially at the same time.

Ishita: Oh, that's interesting, but how can we find the distance to lightning?

Amol: Let us first get indoors before the distance to lightning becomes zero and we are gone.

Ishita: Jokes apart, I'm really keen to know.

Amol: If you want to know the distance to lightning, just clock the time in seconds between the flash of lightning and the sound of thunder. Divide this by 5; and you will get an idea of the distance to lightning (in miles). Multiply by 1.6, if you need to know the distance in kilometers. Also remember, sometimes you may fail to see the flash of lightning because of high density clouds, but you will still hear the sound of thunder.

Ishita: Great, I will go back to the park to do the experiment myself.

Amol: Be careful, however. Never expose yourself outdoors. Hundreds of people die because of lightning every year. Once I heard Keith Lomax tell BBC that while driving in southern France, he was caught in a storm. The pouring rain flooded the road and vehicles were cutting across a standing pool of water about two inches deep. Eventually the traffic came to a grinding halt. It was at that time that lightning struck the road, making the pool of water boil.

Ishita: Have people ever survived severe lightning attacks?

Amol: Strangely enough, yes. Darren Milne, a British man trounced death by surviving a billion-volt lightning strike on his head. On January 28, 2008, he was hit by a lightning bolt travelling at 14,000mph which tossed him to the ground and shredded his shirt. When Darren's wife Vicky rushed to him, she saw blood oozing from an open wound

on his head and feared that he may even be dead. But, as she embraced Darren, calling his name repeatedly, Darren opened his eyes and cried, "I can hear you."

Ishita: Can a lightning attack hurt someone permanently?

Amol: I read about Cheryl, a nurse by profession. While at Wal-Mart on a summer day in June 1999, she got the premonition of a big storm in the making. Sensing the incoming storm, she rushed home with her daughter to keep her husband away from the swimming pool. Hardly had she stepped into the house and lifted the phone that lightning hit the place. It ran through the phone line. Shaken by the big boom, her daughter came running. She told her not to touch her because of the fear of electrical current travelling from one person on to another. By this time, the current from the lightning hit Cheryl's right ear and ran across her chest and left arm. Being a nurse, she was well aware of what an electrical shock could do and feared seizures. Surprisingly, nothing happened and she could walk and talk normally. After a few weeks, however, she started having *petit* mal-seizures, which then continued for the rest of her life!

Ishita: Does it mean we should not use telephones when exposed to lightning?

Amol: You are right. Not only telephones, you should also not use iPods, beepers, earphones, Walkman players, laptop computers and such other devices when outdoors. I've heard of a Canadian jogger who ruptured his eardrums, broke his jaw and suffered wishbone-shaped chest and neck burns when lightning travelled through his music instrument wires. Years ago, a Colorado teen was hurt by lightning while listening to his iPod and mowing the lawn. Please know that every piece of electronic gear that is plugged into an electric outlet is vulnerable to a lightning-induced surge, which can enter a house through wiring or plumbing. When lightning strikes a power line, it can send a surge through wiring in

the neighbourhood. The electricity can flow through one's home to anything that's plugged in.

Ishita: How does the electric current pass though a human body?

Amol: Interesting enough, generally speaking, people are resistant to electricity because of the high resistance of the skin. In reality, current passes over our bodies either through excess sweat or metal or in a "flashover."

Ishita: What is your final advice?

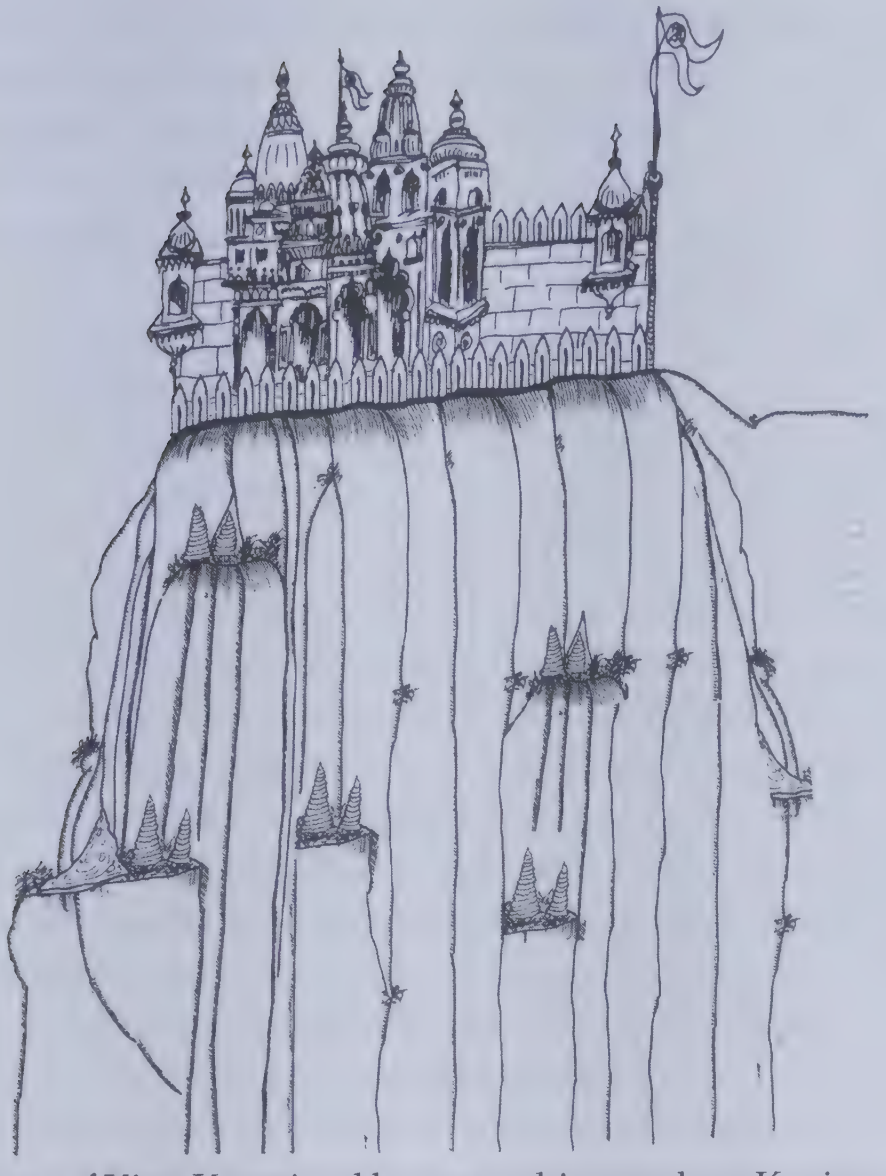
Amol: When thunder roars, immediately get indoors and dance with joy that you are alive, and read this book.

6

THE MISER ROBS HIMSELF

Once upon a time there lived a King well known for his extreme greed and ceaseless lust for wealth. His name was Karorimal, nicknamed Kanjoos. From dawn to dusk, he used all the might of his kingdom to amass wealth by *hook or by crook*. He had neither time nor heart to address issues concerning the welfare of his people. His wealth and greed were like an ever romancing honeymoon couple thriving amidst the misery of his people. The King repeatedly over-ruled his ministers' sane advice and turned a blind eye to the growing wide-spread anguish and unrest in his kingdom.

The smell of his rapidly growing wealth began to spread all around, so much so that the neighbouring states turned jealous of him. Naturally, his council of ministers sensed fear of attack from the neighbouring States. Moreover, the plight of the people because of abject poverty became so appalling that the anger of people was clearly visible on their faces. When the rapidly growing restlessness among the people and the perception of threat from neighbouring states became alarming, one of the ministers mustered courage enough to alert the King against a possible attack from the neighbouring States and apprised him of the brewing revolt against him by his own populace. The minister pleaded for grant of at least unavoidable expenditure related to the security of the State against external aggression, safety of the King's palace against the wrath of natural hazards and maintaining essential



The palace of King Karorimal known to his people as Kanjoos, was highly vulnerable to earthquakes and landslides.The King was so miser that he spent no money at all, either in maintenance of the palace or in ensuring its safety, despite the advise of his Council of Ministers.

public services. To the King, all these demands looked quite unnecessary and avoidable expenditure. Little did he realise that the healthy, educated and prosperous people of his kingdom would have raised his income by pounds whereas he felt contented collecting pennies!

One thing which hit the King hard was fear of a possible attack from one of the neighbouring States. He began to

see the dreadful consequence of neglecting his army in his dreams and suddenly began to feel weak and threatened. The very next day he summoned his council of ministers to ascertain the level of the perceived threats to which the State was exposed and the desired level of preparedness to ensure protection.

All his ministers told him in one voice that the threat of invasion is real. They once again took the opportunity to alert the King about the growing unrest, the revolting public and the neglect of education, health care and the army. The King was told that the State does neither have a plan nor the capacity to fight natural disasters, especially earthquakes and landslides, to which the palace is highly vulnerable. The palace was poorly maintained and needed urgent attention. After listening to his council of ministers, the King declared education and welfare of his people as a non-issue and placed it on the back burner, but decided in favour of quickly strengthening the army and seeking further expert guidance in protecting the palace from the wrath of earthquakes and landslides. Thereafter the meeting was deferred for a detailed look at the budget for approval, at the earliest.

Within a fortnight, the ministers reverted to the King with a detailed proposal for security of the State and safety of the palace. The proposal for ensuring safety of the State chiefly included raising the salary of poorly paid army personnel, investment in new recruitment, purchase of equipment and training. As regards the safety of the palace against earthquakes and landslides, the proposal detailed out plans for structural strengthening of buildings and slopes. They informed the King of the disastrous consequences of any further neglect, which included threat to the life of the King himself.

Fearing an invasion any time, the King most reluctantly sanctioned money to ensure that the army was quickly raised and appropriately positioned. He was however

not yet fully convinced about the expenditure for dealing with natural disasters. He hated the idea of spending on disaster education, raising of youth brigade, empowering of communities and creating a watchdog body to manage disasters. His argument was simple. Why fear disasters now when nothing had happened for all these years? He was once again reminded that the palace was sitting on a geological fault and the location had a known history of earthquakes of magnitude 8.1 and earthquakes of large magnitudes tend to repeat at longer return periods, springing surprise. The King was also informed that one of the landslides on the slopes at the rear side of the palace, which had killed 7 people in the past, often got reactivated during the monsoon season. The threat of a major reactivation of this slide was already visible in the subsidence of slope, tilting of trees, widening of cracks on the slope surface, bulging of retaining walls and exposed scars of old landslides. Then there were leaky water tanks which fed water into the unstable slopes. Moreover, certain parts of the palace were sitting on a filled up area and such areas generally fail by liquefaction. Moreover, earlier also experts had warned that an earthquake-induced landslide could be a sudden event leaving no time for warning.

Do not terrify me by using bamboozling words like liquefaction. What the hell is it, inquired the King?

Sir, those slopes which are made of a thick bed of poorly drained sandy soils, which gets waterlogged during the heavy rains do fail by what is called liquefaction, especially when subject to an earthquake tremor. When liquefied slopes cease to have strength and begin to flow like a stream of mud.

All this did not impress the King. Most reluctantly, he asked for resubmission of the plan and budget, clearly distinguishing between what was vital, essential and desirable. He would like to fund only the vital needs.

The council of ministers submitted the revised proposal after pruning the budget as much as they possibly could.

The vital component of the proposal covered structural strengthening of the palace to make it earthquake safe and reinforcing of the slopes to make them landslide safe. The budget was sanctioned.

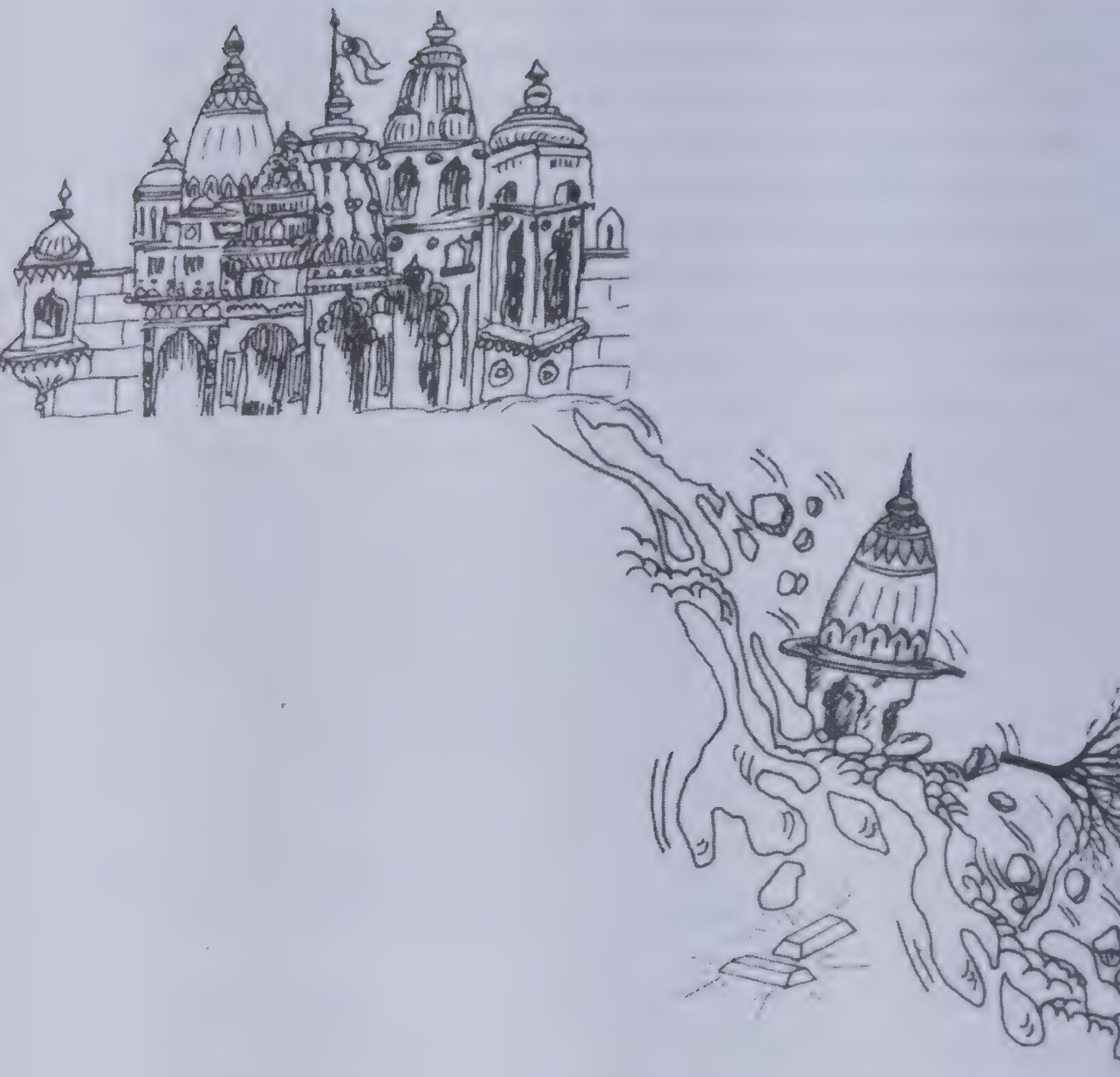
In parallel, the King thought of a secret plan to protect his wealth. The plan was to relocate the existing treasure chest to a new, non-obvious location at the rear side of the palace. After identifying the location all by himself, he secretly mobilised the equipment for excavating the slope as

The King feared attack from the neighbouring States more than he feared natural disasters. In order to protect his wealth, he carried out his secret plan of relocating his treasure-chest in a trench dug on the rear slopes of the palace. He did all that by himself on a moonlit night without the knowledge of even his Queen.

was necessary in order to hide the treasure chest at the new location. Suspicious as he was of everybody, he decided to do this job by himself under the cover of darkness on a moonlit night. He dug a small trench in the landfill on the rear slopes and after carefully checking the inventory, the treasure-chest was lowered into the trench, wrapped in a waterproof membrane. The trench was then refilled to the topography of the original slopes. An inconspicuous landmark was created for the ease of location identification and periodic inspections. Having achieved all this, King Kanjoos felt proud of his plan and became cock-sure that his wealth would remain secure even in the worst of times.

Luck was not on his side, however. Monsoon broke within a couple of weeks of establishing the new treasure hideout. One day, it suddenly started raining and the rain continued for almost three days. The King looked at the sky overcast with clouds. Lighting and the sound of thunder were indicators of more rain to come. Sensing threat to the rear slopes by landsliding, the King himself shifted to a room at an altitude from where he could keep a close watch on his treasure-chest. The rain continued. The overland water flow began to inundate low lying areas of the palace and the slopes. The King saw a standing pool of water at the location of the treasure- chest.

It came as a rude shock to the King when an earthquake hit the palace from nowhere and shook it for 45 seconds. His ministers rushed in to report to him the damages seen in many parts of the palace. While this was happening, the King saw from his window something so stunning that his heart sank into his boots. The sandy fill into which the treasure-chest was buried, began to slide downslope. Clearly, it was a liquefaction failure. The huts of the watchmen were rapidly tilting and sinking, and so were the trees which had stood vertical for decades. Water streams were seen to appear at several locations, creating more flooding.



One day the King's horoscope took an ugly turn . The long awaited earthquake and landslides on the rear slopes did arrive causing structural damage to the palace building. The treasure chest buried underneath the slope was swept away with the rapidly moving landslide mass. Gold bars from the treasure chest were seen scattered all over the bottom of the slope. The King who survived the earthquake, died of the shock due to loss of wealth.

It was at that time that one of the ministers rushed into the King's chamber to report to him the collapse of the army bunker and serious damage to certain parts of the palace. However, the King was more worried about his treasure chest than about the damage done to the palace or the people killed. Shaken to the core, he rushed outdoors to track down the treasure-chest himself.

No sooner had he stepped out that he saw a massive landslide sweeping the slope away. The treasure-chest also disappeared with the landslide. The King became highly nervous and totally confused. He asked his ministers to accompany him to trace the treasure-chest about which they had no knowledge. Before the King could reach the heaps of debris at the bottom of the slope, his starving population pounced at the gold bars seen scattered, here and there. In this way the wealth, by itself, reached the people to whom it belonged!

The King fainted and died of the shock.

Like the King, we are also miser in investing on our safety. We have for long neglected our mountains, river systems, our forests, fauna and flora. On the other hand, those of us who are spendthrift rob Mother Earth of our resources by reckless urbanisation, mining and by taking recourse to development which is not sustainable.

The morale of the story is: "The spendthrift robs his heirs, the miser robs himself." These are the words of wisdom attributed to Jean de la Bruyere, a French Philosopher of the Sixteenth Century. According to him, if we divide the world into people who are misers and those who are spendthrift, and if we do not consider ourselves miser, are we any better? Are we not plundering resources as if we are the last generation on the planet without any accountability to posterity!

7

A BOLT FROM THE BLUE

When a disaster takes us by complete surprise as it often does, it generally appears to have come as a bolt from the blue. This is perhaps a biblical expression embedded in the quote, "Arrestment, sudden really as a bolt out of the blue, has hit strange victims" from the French Revolution 1837, attributed to Thomas Carlyle.

Are all disasters to be regarded as a bolt from the blue or is it really a cover up statement, disaster managers and others often make to hide ignorance and dodge accountability? Arguably, if lightning strikes a bystander, loitering out in the open, engrossed in gazing at the beauty of thunder and lightning, it could perhaps be regarded as a bolt from the blue partly because of his ignorance about the harm lightning could do and partly because of the exceptional speed with which lightning strikes.

Disasters can be slow, not so sudden, sudden and rapid and all of them cannot be regarded as a bolt from the blue. Hazardous events such as eruptions of volcanoes and occurrences of earthquake are classed as sudden events because, at the present state of knowledge, they cannot be foreseen. The same thing, however, cannot be said of hazards like cyclones, landslides, floods, famine and drought, which, if carefully monitored, usually provide sufficient alert for a stitch in time. Disasters such as droughts and famines notify their arrivals long before they actually arrive! Disasters which

arrive slowly stay longer. Strike of hazards like epidemics and drought last for months; floods and cyclones affect us for days; thunderstorms and tornadoes for hours; and earthquakes for minutes to seconds. Lightning does not even give one sufficient notice to look at the wrist watch.

If disasters were also to choose an unfavourable strike time, longer strike duration and densely populated locations, the damage could be extremely high. The strike time was 6 o'clock in the morning when the Great Kangra earthquake[1] of magnitude 8 struck Kangra in the state of Himachal Pradesh of India on 4th April 1905. Since most people were still asleep at that time, it gave little opportunity for them to escape. A local correspondent of the newspaper Pioneer of 11th April 1905 reported that, "A vast majority of residents were abed at the time and got crushed in the ruins. The houses lurched forward with violence and came down as if they were made of cards, those left standing, collapsed with the back movement." Although earthquakes normally last for a few seconds, this one rocked Kangra for 120 seconds. The death toll rose to 19,727. For the victims the disaster came as a bolt from the blue.

It is not necessary for an earthquake to have high magnitude and a long duration to cause higher levels of damage. An earthquake may be of a low magnitude and it may cause still high damage. Similarly, a short duration earthquake too may turn out to be deadlier than a high duration earthquake in some other situation. The Tangshan earthquake of 28th July 1976 in northern China struck just for 16 seconds and inflicted greater damage than many earthquakes of comparable magnitude could do in 30-90 seconds. This was because the earthquake chose to strike at 03:42 am when most people were fast asleep. Even for those

1 Kangra Earthquake was originally assigned magnitude of 8 on the Richter scale. After 90 years, the rating was challenged and fixed at magnitude 7.8. If that be so, Kangra earthquake may technically fail to qualify as a great earthquake, but so what? It was deadly enough.

who found a window of opportunity to escape, the aftershock of magnitude 7.1 that followed the main shock of magnitude 7.8 did block their way to safety.

Understanding of disasters in their true perspective and predicting them in advance is a highly complex affair. It is only by taking recourse to scientific investigation that we can explain cases which otherwise defy simple logic and predict events.

Disasters will continue to be regarded as sudden events so long as we do not perfect the art of prediction. The day we succeed in predicting hazardous events, our perceptions about the degree of swiftness with which disasters strike will begin to change for the better. In the meantime, every effort is needed to nurture curiosity, grow scientific temper and make greater investment in disaster prediction.

The Chinese succeeded in predicting the Haicheng earthquake of February 1975, because of which scores of lives were saved by timely evacuation of 100,000 people from the city of Haicheng. Only three people were killed. How did Chinese predict the Haicheng earthquake?

At Haicheng, apart from other scientific data, numerous earthquake foreshocks, observations on water levels in wells and the observed restlessness of animals helped in making the prediction which happened to come true. Among other things, many people saw snakes coming out of their burrows even a month before the city was hit. Also a group of rats was seen to appear from nowhere. From the sites of other earthquakes there have been reports of bears and cats coming out of hibernation, reptiles getting restless, and deep-sea fish rising to the surface. Fishes in the Hokkaido coast of Japan were once seen jumping as if to call attention to an imminent earthquake.

If the Haicheng earthquake prediction was so accurate, why then did the Chinese fail to predict the Tangshan earthquake a year later? Did they not observe foreshocks

and strange animal behavior in this case? A day prior to the earthquake on the night of 27th July, is it not true that there were strange lights, fireballs and lightning seen across the skies?

Indeed loud and roaring noises were heard, many species of animals were found to be restless and the night was both rainy and windy.

Two things become clear from past experiences: earthquake prediction is not child's play and although people have eyes, many vital observations often escape their attention. They have ears, but they fail to listen to the sounds they are not familiar with. Over the period of years, we have come to know that "Within the confines of our needs, the human ear is very sensitive." However, medical science has now established that, compared to the animal world, our hearing capacity is hardly exceptional. The human ear hears sounds with wave frequencies ranging from 16 cycles per second to 20 000 cycles per second. Porpoises have the capacity to hear extremely high frequencies, up to 100 000 cycles per second. A human being hears best in the range 1000 to 2000 cycles per second, which just happens to be perfectly suited to human voice.

Animals respond so quickly, perhaps because of their strong sensitivity to smell. For example, a dog's nose is over a million times more sensitive than the human nose and compared to a dog's capacity, human smelling skills are very inferior. Police dogs have incredible smell capacity. But they, strange as it may seem, cannot distinguish between the body smells of identical twins, even if the twins live in different towns, have different jobs and eat dissimilar foods. Salmons use their sense of smell to find their way back up the rivers in which they were spawned. Similarly, animals, especially horses, dogs, and birds have an amazing sense of direction"[2]

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2 Jagman Singh (1998): *My Tryst with the Projects Bhakra and Beas.* Uppal Publishing House, New Delhi, pp 16.

According to Jane Green, "Nothing in this world happens without a reason. That we are all exactly where we are supposed to be, and that the pieces of the puzzle have a tendency to come together when we least expect it." Prediction of hazards due to thunder, lightning, cyclones, dust storms, floods, landslides, drought and famine are already within our grasp. The way science and technology is advancing, the day is not very far away when we will also be able to predict volcanoes and earthquakes. Once that happens, and we get alert on time, disasters will cease to be regarded as a bolt from the blue!

8

WHERE IS THE BULL'S EYE?

Making a reliable prediction[1] of a disaster remains a daunting challenge for scientists, but for quake astrologers, usually it is quite fun and a highly paid past-time. The history of mankind is replete with examples of quake astrologers unfailingly hitting the bull's eye with tall claims of mastery over the art of prediction. Talk to scientists about it in any part of the globe and ask them to cite a success story of an earthquake prediction, and ten out of ten will tell you of the successful prediction of the Haicheng earthquake of February 1975 and stop thereafter without citing another success story. Talk to astrologers across the globe and you will hear entrancing stories of successful predictions, one after the other, till you switch off your lights. Whether drought, floods, cyclones, earthquakes, tsunamis or volcanoes, their claims remain as burly.

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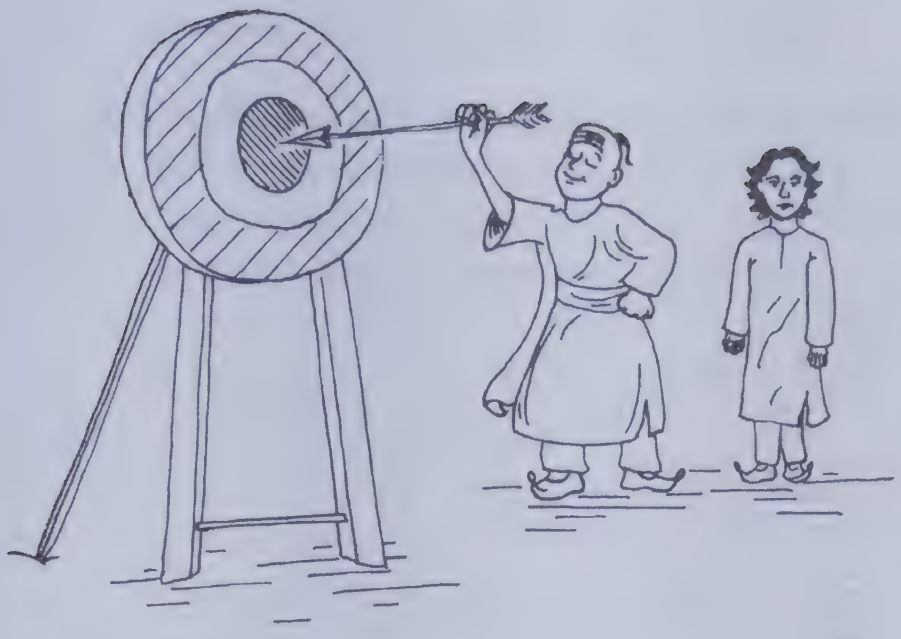
1 The word *prediction* is of Latin origin, a hybrid of words *prae* (meaning, before) and *dicere* (meaning, to say). Prediction therefore literally means *saying something beforehand.* The term *forecast* is also made of hybrid of words *fore* (meaning, front) and *cast* (meaning, to throw). The term *forecast* therefore means to *throw something upfront.* When we talk of prediction and forecasting in the context of natural hazards, for example earthquakes, basically the expectation would be that in prediction, we clearly state the anticipated location of an earthquake, it's likely magnitude range and the window of its strike time to facilitate decision making. Merely declaring that an earthquake will occur next week is more of a scare than science and has no meaning.

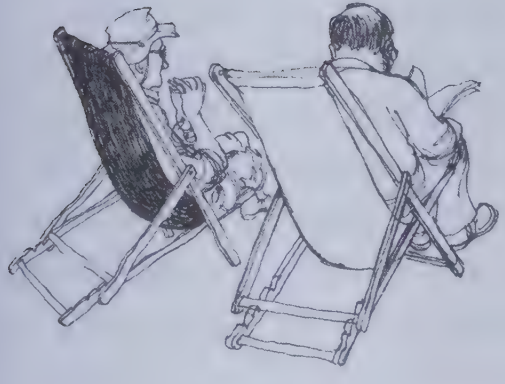
Once upon a time there lived an astrologer, highly boastful of his numerous successful disaster predictions. For him the meaning of the terms *prediction* and *forecast* were the same, often used interchangeably because he always sounded cocksure of his prophecy. On every opportunity, he lost no time to narrate countless success stories of his authorship. The local newspapers began to highlight the success stories on their front pages. The TV channels too invited the astrologer for repeat interviews. Institutions engaged in research on prediction of disasters began to feel envious. They too began to secretly approach the astrologer under cover of darkness and his reputation began to grow and glow by the day.

The astrologer was well supported by his son as the second-in-command. In archery, the reputation his son had managed to earn was of a bull's eye hitter. There were several special exhibits in and around his house showing concentric circles with arrows exactly piercing the bull's eye, symbolic of perfect predictions. This exhibition of such exceptional talent both surprised and impressed every passerby, for months on end.

As luck would have it, one day his own town was hit by a major tropical cyclone in which many members of his own family were killed. Only he and his son somehow survived and that too because they were out of the village on that day. This single news brought down his credibility nose diving. His sources of income began to dry and the TV news channels began to work extra time to expose his failure and falsehood. As the media scrutiny followed, it increasingly began clear that his so called predictions were merely *after thoughts*, widely publicised as paid news.

It was at that time that the village headman felt suspicious of the oft-publicised exhibits of concentric circles with arrows exactly hitting the bull's eye. He began to ask whether it was possible for someone to unfailingly shoot arrows straight into the bull's eye? If he was really so good at





The astrologer's way to fool people was either to draw the concentric circles after placing the arrow at the bull's eye or draw the concentric circles before placing the arrow at the centre. He extended the same trick to show up accurate predictions soon after the occurrences of disasters by investing in false publicity through paid media .

archery, why did he not vie for a gold medal at the Olympics?

The village headman with his team at once summoned the astrologer and his son and asked them to give a practical proof of their skills by actually hitting the bull's eye, in their presence.

Highly embarrassed, the astrologer had no option other than to confess that his son always shot an arrow first and drew the concentric circles around it, afterwards! "This simple talent of my son had inspired me to predict disasters after their occurrences!" said the astrologer.

History is witness that astrologers in different parts of the world have made tall claims of their successful forecasts of natural disasters, especially earthquakes. Three things can be said about these forecasts. In most cases, the predictions are false and result in unnecessary gossip, rumours and public scare. If, by chance, any of the forecasts come true, there is a stampede for credit-taking, even without a sound basis to support the claim. Thirdly, bogus forecasts sway public minds from science to the supernatural.

We are ourselves responsible for encouraging false alarms by listening to quakes. India's Prime Minister Pundit Jawaharlal Nehru never tolerated superstitions and unscientific ramblings. On one occasion when lakhs of pilgrims from all over India flocked to the sacred cities of Banaras (now Varanasi), Rishikesh and Hardwar, rumours were abuzz that the end of the world had come, and everyone must get ready to go. Nehru asked people not to be foolish. Even then many people, out of fear, slept outside their houses under the open sky. What is more, the rumour also rapidly spread to the neighbouring countries. Consequently, the Prime Minister of Burma (now Myanmar) reportedly closed all slaughter houses for three days as a mark of his country's prayers for human survival.

Of the many glaring instances of bogus forecast, the one declaring the end-of-the world in February 1962 had

captured global imagination. It all began with the astrologers of the city of Calcutta (now Kolkata) in the state of West Bengal, India, who saw the face of extinction in the rarest of rare planetary configuration. According to them, the Sun, the Moon and the planets Venus, Mars, Saturn, Jupiter, and Mercury were all poised to move into their respective rare and unique synergistic positions opening floodgates of cataclysmic events including earthquakes, volcanoes and tidal waves, to spell doom.

In late 1983, Acharya Rajneesh[2] reportedly warned his Californian followers to leave the state by the year's end. He predicted that 1984 would introduce a fifteen-year-long series of natural and man-made catastrophes, including earthquakes, volcanic eruptions, violent storms, and a nuclear holocaust. According to him San Francisco, Los Angeles, New York, Bombay and Tokyo were most vulnerable. The year 1984 of prediction is already behind us by decades. We now clearly see and realise that predictions of this kind without solid scientific basis can do more harm than good.

There are also some astrologers who practice a curious blend of astrology and science in the forecasting of events. One such astrologer, Murthy, reported in 1993 that the cause of earthquake activity is to be traced to the movements of the precession of the equinoxes. He cited the work of another astrologer Raman whose prediction of the solar eclipse of 31st July, 1981, reportedly led to the prediction of powerful earthquakes in Iran and Turkey. He had also reportedly predicted occurrences of earthquakes in Turkey, Mexico, Iran, Japan and Western Asia, based on movement of Jupiter in the zodiac arc of Libra, particularly traversing the arc of Chitta constellation.

Some astrologers have claimed that earthquakes generally occur one or two days before or one or two days after an eclipse and on the new moon and full moon days.

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2 Forecasts—Clairvoyants

The great Kangra earthquake of 4th April 1905, the Quetta earthquake of 13th May 1935 and the Assam earthquake of 15th August 1950 all happened on new moon day. They do not speak about the long list of earthquakes which have nothing to do with the new moon and the full moon days!

Those in the game of prediction must know that prediction of hazards like earthquakes is a complex affair. It requires continuous tracking of crustal movements, seismic, geo-electric, geomagnetic, geochemical, geothermal observations and geodetic and ground water measurements. Increasing attention is now being paid to geophysical and geochemical methods, statistical analysis, chaos physics, ground and satellite mapping, atmospheric precursors and real-time monitoring to make reliable predictions.

Predictions of weather related disasters have considerably improved thanks to the remarkable progress in weather forecasting, instrumentation, monitoring and computational technologies. In the near future, we will be able to foresee natural hazards like drought, hurricanes, tornadoes, thunderstorms and lightning well ahead of their occurrences. About 15 years ago, advance warning about occurence of tornadoes was given for only about 45% of the cases. Today the figure is close to 90%.

It is a mighty challenge in front of our scientists, educators and community leaders to inculcate scientific temper in the public at large and work towards the day when our scientists can really hit the bull's eye and throw quakes and imposters out of their jobs!

Will our problems end, once we master the art of disaster prediction? Ryuho Okawa, in his book 'The Golden Laws', offers a glimpse of the events that await humanity in the future. While claiming power to, "give a concrete picture of things to come", he refrains from doing so because if," a comprehensive picture of the future is presented, there would be a danger of it becoming a heavy burden on people causing

them to lose their will to endeavour." Some of his prophecies are stunning. For example, "In the twenty second century, the United States will sink beneath the ocean, leaving a narrow peninsula running down in the line of the present Rocky Mountains." He also speaks of "Movement in the Earth's crust in what was once the USSR, the prophecy being that, in the twenty-third century, the western half of the country, centered around St. Petersburg, will subside, to be followed by a similar collapse in Central Asia".

Forecasts, Predictions and Prophecies may all eventually aim at hitting the bull's eye but the real difference will come when we act decisively with vision.

9

THE PROOF OF THE PUDDING IS IN THE EATING

For more than 22 years, beginning 1964, I've trekked and travelled through the eastern, central and western Himalayas and have seen incredibly steep slopes and witnessed deadly fragments of falling rocks exploding like a fusillade. Over the years, I have also heard several horrendous tales of violent monsoons, rivers in spate, flash floods, cloudbursts, demolished bridges, impossible communication and of the sorrow of stranded travellers.

On one occasion in 1966, while travelling on the North Sikkim highway in the State of Sikkim in India, I saw huge piles of debris blocking about a 40m wide stretch of river Tista creating a dam across it. The dam was probably 15-20m high and appeared to me to be on the verge of bursting. After stopping the vehicle at a safe location on the narrow road and moving on to a vantage point, I had a much clearer view of the landslide dam and of the debris flows which were continually pouring into the river. It was the monsoon season at its peak. I could clearly see some of the moving landslides on the valley slopes all around, dumping tons of debris into the river. When my fear of the bursting of the dam of debris did not come true even after waiting for about 15 minutes, I thought of continuing with my onward journey. Hardly had I returned to my vehicle to resume my journey that I heard a deafening sound created by the bursting of the dam causing a massive flash flood.

About the same time, the weather suddenly turned hostile, the sky became dark and visibility became extremely poor. After somehow managing to inspect a site a few kilometers away, I quickly returned to the base camp. Upon reaching there, I was told that the flood wave resulting from the dam burst had devastated the area, and destroyed a bridge nearly 300m downstream. Curious as we were, early in the morning next day, we reached the location where the bridge had disappeared leaving the abutments behind. I then spoke to two people I saw there and wanted to hear their versions of the eyewitness story. One of them who lived nearby told me that it was for the third time that a bridge at the very same location had been destroyed. When the first bridge got destroyed, the second bridge was built, and when the second bridge was destroyed, the third one was constructed at the same location with more or less the same design. It was obvious that the plans for reconstruction of the bridge had overlooked the possibility of failure by the bursting of a dam, upstream.

In my long professional career, I've come across dozens of similar cases of repeated bridge failures at the very same location. The bridge at Lyhengewella in Sri Lanka was destroyed for the second time by a violent rockfall for which it was not designed. In the Uttarakhand tragedy of June 2013 in India, several bridges were destroyed at the very same locations where they had been destroyed earlier. The moral of the story is that, at the time of disasters, an unsafe bridge is much worse than no bridge at all and its design is merely a useless scrap of paper if it fails to serve the purpose for which it is built. Similarly, plans for disaster management are no good if they do not hold on the ground?

The proof of the pudding is in the eating!

There generally remains a disconnect between a disaster management plan as made and the disaster management as required on ground because of several reasons. Failure to

anticipate problems before they occur, lack of capacity and coordination to implement the plans and absence of urge to improve upon the plans through experience are some of the well known reasons. It is almost certain that our planning exercise will be fruitless if we fail to hear the cries of victims while preparing our plans.

There is one more reason why we may fail even if the plan is prepared in heaven. We often ignore the importance of placing the right people at the right place for doing the right job. "The art of management makes all the difference between heaven and hell. In heaven, the policemen are English, the cooks are French, the artists are Italians, and the administrators are Swiss. In hell, the policemen are French, the cooks are English, the artists are Swiss, and the administrators are Italians."[1]

In the ultimate analysis, we are known not by our intentions, but by results achieved on the ground. The time has come when we can no longer afford to neglect our planet. We can also no longer remain untouched by the suffering of disaster victims, growing in numbers. A determined effort is necessary to wring out shameless violence against nature and usher in the era of zero tolerance against plundering of natural resources. It's going to be doubtless a long, arduous journey, and therefore the real question is whether we have courage to bite the bullet amidst widespread turbulence, unrest and chaos of all sorts? Are we prepared for the long haul? Little do we realise that disaster risk reduction is easier said than achieved. We know that *Rome was not built in a day* and yet we pine for push-button solutions and quick-fix remedies. Naturally, the best of human minds must keep working twenty-four seven to find apt solutions to counter factors such as climate change, mindless urbanisation and sloppy development.

We must stop *barking up the wrong tree*, learn to walk the

1 JRD Tata—The Joy of Achievements.

talk with a clock and a compass in our hands and remove the hiatus between our scientific and operating tempers. Never should we act like *a shag on the rocks* as it usually *takes two more to tango*. We should aim at a paradigm shift in our approach from rescue and relief centric planning to planning for disaster prevention and mitigation.

By and large we all agree that change achieved by force is always ephemeral and ineffective. We need change of old mindsets and cheering up of saddened hearts. The bureaucracy in many developing countries, by design, favours the culture of *doing things right*. This must change to the culture of *doing the right thing*. The disaster management plans favour fixing of individual problems. The focus should shift to establishing *the culture of safety* in which problems are prevented before they can occur. We need the right kind of disaster education. The proliferation of educational institutions without matching effort to create a breed of good teachers and good text books hinder rather than help progress. My final message is, "If you want to build a ship, don't drum up men to collect wood and don't assign them tasks and work, but rather teach them to long for the endless immensity of the sea."[2]

This is indeed a great thought. Will it work?

Of course, yes, but we will have to work as one team and work hard and get into an auto-pilot mode. We need both vision and action. As a Japanese proverb goes, "Vision without action is a daydream; action without vision is a nightmare."

How do we know our vision and action are well tuned and how shall we monitor whether we are progressing or not?

Judge everything in terms of outcome and not outputs. *The proof of the pudding is in the eating.*

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2 Antoine de Saint Exupery—A French writer.

10

DREAM LOST IN AN UNOPENED BOOK

"The Indian epic of Mahabharata is truly great, but If you want to read one of the greatest adventure stories of all times, read the epic of King Gesar, the fearless lord of the kingdom of Ling in the eastern part of the Tibetan plateau," said Mary to her daughter Kristin.

Kristin: Haven't heard of him or the epic? What is it about?

Mary: It is about display of courage and compassion in the face of war in a world full of fear, greed, turmoil and religious bigotry. The epic makes an immense contribution to human civilization as it inspires everyone to live joyfully with tons of courage. Across the globe, it is being read both in prose and poetry, and there are dozens of books on it in circulation. I myself bought the fascinating book 'Warrior Song of King Gesar' authored by Douglas Penick from a flea market shop. It was like buying several tons of gold for a farthing.[1] I commend you to read this.

Kristin: I certainly would, but I cannot resist asking what is it all about?

Mary: It powerfully conveys that regardless of hardships and failures, a relentless spiritual journey is fundamental to a secular way of life and no defeat can prevent the human race to work towards achieving true social harmony.

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1 A former monetary unit and coin of the UK equal to a quarter of an old penny, withdrawn in 1961.

Kristin: I'm reading a lot about our planet Earth, climate change and natural disasters. Does it say anything about these, which threaten the very foundation of human survival?

Mary: Oh yes, it does. Let me read a passage from the Warrior Song of King Gesar:

"Our earth is wounded. Her oceans and lakes are sick, her rivers are like running sores; the air is filled with subtle poisons. And the oily smoke of countless hellish fires blackens the sun. Men and women, scattered from homeland, family, friends, wander desolate and uncertain scorched by a toxic sun. In this desert of frightened, blind uncertainty, some take refuge in the pursuit of power. Some become manipulators of illusion and deceit. If wisdom and harmony still dwell in this world, as other than a dream lost in an unopened book, they are hidden in our heartbeat. And if it is from our hearts that we cry out and our voices are the single voice of this wounded earth, our cries are a great wind across the earth."

Kristin: When did he say that? I know it is as true today, but it is surprising to me that it was true in his times as well. The passage you cite from the Warrior Song of King Gezar is indeed an eye opener to me and I already feel fully charged, but I am curious to know what is really meant by a dream lost in an unopened book?

Mary: Don't you see that the epic of King Gesar itself is an *unopened book* for you, as also for millions of others across the globe? Have you heard of an *unopened flower*? We call it a flower bud which hides its petals and its fascinating beauty. We see the beauty of a flower only when it opens. Some flowers remain open until they die, but others open during daylight and fold up at night. Unlike a good flower, a good book never dies; and when it is open, it radiates a light of its own. But when it remains unopened, we are robbed of the never-fading light it would have radiated and that would simply mean the death of not one, but of a thousand dreams!

Kristin: Where do we look for good books that could

make us dream and work towards restoring the respect for Nature and freeing the world from the wrath of disasters?

Mary: The good books will as much look for you as you look for good books! "Do not ever have an impression that the world is without good books. On the contrary, libraries across the globe are full of them. Our regret is that we seldom go to good libraries, which is why good books continue to remain *unopened* for us. Some of those who fancy buying new arrivals dispose them at flea markets, many times without even reading them.

It was Jorge Luis Borges who said, " I have always imagined that paradise will be a kind of library." Go to one such library and get immersed in the ocean of those books, if you are really serious to feel their powerful presence. Believe me, your future will begin to smile at you the moment you hold a good book in your hand. The influence of good books lasts through generations.

Let me also quote Carl Sagan, who believed, "A book is an assemblage of flat leaves imprinted with dark pigmented squiggles. One glance at it and you hear the voice of another person, perhaps someone dead for thousands of years. Across the millennia, the author is speaking, clearly and silently, inside your head, directly to you. Writing is perhaps the greatest of human inventions, binding together people, citizens of distant epochs, who never knew one another. A book breaks the shackles of time—proof that humans can work magic."

Kristin: I fully agree, but is it not a fact that we do not have enough good books in the area of disasters?

Mary: Speaking of learning through books about disasters, know for sure, that the subject is made of many disciplines invaded by scores of intermingling sub disciplines. You may not get many good books with the title Disasters on their cover pages. Till such books get written, look for books which connect us with evolution and the growth of scientific

concepts, postulates and theories. Ask your teachers to fill in the void created by the absence of good books.

Kristin: Do we have enough good teachers to teach the subject of disaster management?

Mary: In this field, we are not only short of good books and good teachers, but also of good students. If a good book is not available, we are forced to read bad books, and reading a bad book is worse than no reading. Whenever we read a bad book, we lose a bit of ourselves and the spaces around us darken. Good books on the other hand, brighten the space around us and ignite our imagination. Likewise, if a good teacher is not available, we are forced to learn from a bad teacher, and learning from a bad teacher is worse than no learning at all. The influence of good teachers lasts through generations.

Always remember: Good teachers are not born, they are made so by good students who display an insatiable curiosity to learn. Where students lack appetite for learning, the intellect of a teacher is never challenged, which is why both teachers and students, in such cases, pull each other down to a level at which education loses all its meaning.

Let me tell you a story which will convince you of what I just said.

In the recent years, there has been a mushrooming of institutions which impart degrees and diplomas in disaster management. One of the newly established institutions started a four module diploma course in disaster management for the first time. When it found no takers for the course, it was opened to students at the bottom of the merit pile.

The teaching started with the first module which aimed at making the students familiar with different types of hazards such as volcanoes, earthquakes and cyclones and introducing technical terms like hazard, disaster, vulnerability and risk.

At the end of his lecture, the teacher invited questions.

Hurt by the pin-drop silence, the teacher randomly picked four students and ordered that they ask questions.

The first student, rather than questioning on what had been taught in the class, complained about the discomfort in the classroom and asked if air conditioners could be fixed in the classroom to supplement the slow moving fans. Such a move would certainly help students in remaining attentive in the class.

While supporting the request for air conditioners, the second student asked, "Who all should be contacted for getting a decent job after the diploma was granted, and when?"

The third student said that this was his question as well and asked if some field trips could also be added to supplement classroom teaching?

The fourth student asked that why such idiotic questions were being allowed in the class that trivialise studies?

Agreeing with the remark, the teacher warned the class not to squander any more time with useless questions and fully concentrate on the lessons taught.

The class was adjourned.

In the second module, the teacher taught the way hazards, vulnerabilities and risks are assessed and how disaster risk reduction plans are drawn. A lot of emphasis was given on disaster preparedness, capacity building, prevention and mitigation. After administering the module, the teacher invited questions.

Facing the characteristic repeat silence, the teacher had to name the next batch of four students and order questions.

"Sir, were you taught the same four modules by your teacher which you are teaching us now?" asked the first trainee.

The second trainee asked whether the examination question papers would be restricted to what is being taught in the class?

"If not, can you please suggest stuff for additional reading,?" asked the third student

"That would be nice indeed, Sir, but it would even be better if handouts could be given," said the fourth student.

The teacher felt very uncomfortable with the kind of questions asked, and warned that if the right kind of questions were not asked to clarify doubts, students would be losers in the examination.

In the third module, real life examples were cited to demonstrate how survival skills helped people in times of crisis, and how trained disaster managers were able to save hundreds of lives. The teacher also talked about disaster prediction and early warning. The question-answer session then followed.

"Sir, have you ever gone through the pain of a disaster yourself,?" asked the first student.

"And Sir, how many lives were you able to save so far,?" asked the second student.

"Did you find women more vulnerable than the men folk,?" asked the third student.

"Sir, what are you going to teach us in the fourth and final module,?" asked the fourth student.

The teacher was somewhat embarrassed as he was without any such first hand experience of dealing with disasters. Hurriedly he concluded for the day by saying that the final module would deal with the rehabilitation and reconstruction aspects of disaster management and this time he would not invite but ask questions himself.

The last training module was finally administered. The teacher then asked whether the students were happy with the teaching.

"Sir, that will depend on whether we pass the test", replied a student.

"Fair enough". Tell me how many of you are going to take disaster management as a career?

"Sir, that would depend on whether we get a job?" came the reply.

"Oh, I see! I wish you good luck. My only worry is how you chaps are going to pass the examinations because you have neither asked questions nor taken any notes in the class."

"But Sir, we know that what you have taught is all there in the book authored by you," spoke a student anonymously.

"My dear boys and girls, people who read books are of three types: those who have a thirst for learning and hunger for knowledge; those who read merely to learn enough so that they can teach the next day; and those who feel forced to read for reasons such as obtaining a diploma certificate or a university degree. I place you all in the third category. In our dictionaries, *read* comes before *success* and *success* comes before *work*. It should not be the reason that students *read* just for *success* and begin to expect *success* even without *work*!"

"Sir, do you fall in the first category?" asked a student.

The teacher was embarrassed and the class ended with a peal of laughter.'

When Mary finished the above story, Kristin too could not control her laughter. She asked Mary to sum up.

Mary: Liberate your imagination and lift up the lid of your expectation. In this age of knowledge, even good is not enough, if better is possible. And always remember, when you do not have good books to read, that will allow you all the more time to introspect, think and experience. Recourse to bad books is not the answer.

Bad books prevent you to think, good books inspire you to dream and unopened books distance you from realising those dreams!

11

GO THE WAY OF THE DODO

The small town of Bharatpur in the State of Rajasthan in India is known world-wide as a paradise for bird watchers. On a bright sunny day in a local public park, children from a local school assembled for a picnic. The teacher accompanying the children sang the glory of Nature drawing their attention to the growing concern over the extinction of certain types of birds in the Bharatpur Sanctuary. How sad that we will never be able to see them again and if the present generation is not able to protect bird and animal life, fauna and flora, and the environment, future generations will not be able to see even some of those birds which we see today, said the teacher..

Rama could not resist inquiring about the birds which were no more to be seen. The teacher recalled a few names of birds which are either extinct or on the verge of it, quipping that many more would go the way of the Dodo!

What is meant by going the way of the Dodo, asked Sunder?

Teacher: Dodo is an extinct flightless bird which was once very common in the island of Mauritius in the Indian Ocean. It was also seen in Bharatpur. I myself have, however, not seen Dodo other than in storybooks and in paintings, replied the teacher.

Why do you call it a flightless bird? asked Anjana.

Teacher: It is said that the Dodo became flightless because of the easy availability of plentiful food around it

The last journey of the Dodo Bird, being carried away by Yama, the mythological God of death. Do you know who is responsible for extinction of the Dodo bird?

and freedom from the scare of predators, adding that those of us living in our comfort zones and languishing in lethargy are also on our way to *flightlessness*.

Raina: I feel sad that we have lost the Dodo. Now onwards, how can we protect the birds from extinction?

Teacher: Begin to love birds and befriend them. Do not encroach on their spaces and freedom. Do not destroy forests and trees which brighten their lives. Do not pollute water bodies. Raina, remind me to show you a book on this in our library, which you should all read.

Vimal: Where is the problem in protection of birds and other species? Why do we interfere with their lives?

Teacher: The population of our planet is increasing fast and people are moving to places where no one lived before. They need much more housing, water, food, energy, roads and other amenities of life for which greedy and ignorant people cut forests and trees, ruin the otherwise beautiful landscape, build on unstable lands, and divert natural water streams. All this destroys the environment and threatens the very existence of birds.

Nirmala: What is the way-out, then? How can we reverse the trend?

Teacher: We should take from nature no more than what we need and ensure that we grow more trees and look after them well. We should carry out development and construction in harmony with Nature.

Amol: It is so simple and yet why are we not doing it already?

Teacher: What we need is a strong will to do so. Deforestation is a curse in the Himalayas and elsewhere in the world. Felling of trees in the name of development still continues. People have become helpless spectators and the local authorities are toothless. It is time to think out-of-the box, and generate mass movements such as, for example, the Chipko Movement in India.

Amol: What is this Chipko Movement all about?

Teacher: Chipko Movement is the story of women of Gopeshwar in the State of Uttarakhand in India, who rose collectively against the menace of deforestation. It was on 4th April 1973 that these women confronted the loggers frontally. A large number of them came out of their houses to hug the trees, preventing contractors from cutting them. In this way they reportedly saved thousands of trees, and therefore the forest area. The movement they started has come to be known as the Chipko Movement.

Rama: Chipko Movement seems to me to be a great idea. How sad it is that the Chipko Movement, despite it being a beam of hope and a wall of support, has also gone the way of the Dodo.

Teacher: You are our hope and we hand over the task of preventing birds and animal life from extinction to your generation. Work hard to establish the culture of non-violence for bouncing back to those glorious times!

12

EVERY PROBLEM HAS A SOLUTION

Disaster managers across the globe have somehow developed the tendency of believing that not every problem has a solution and therefore they are without option other than to accept the fate to which they are condemned. Those managers who refuse to accept defeat may sometimes end up with solutions which are as bad as the problem, if not worse. According to Albert Einstein, it is so because, "Rarely do we find men who willingly engage in hard, solid thinking. There is an almost universal quest for easy answers and half-baked solutions. Nothing pains some people more than having to think." He further adds, "If I had an hour to solve a problem, I would spend 55 minutes thinking about the problem and five minutes thinking about the solution."

While speaking of disasters, many problems are first time problems, neither found in textbooks, nor earlier dealt within the four walls of classrooms. Occasionally such problems place us in difficult situations, giving very little time to think and act. Try and give the same problem to a few people. Many will give up without thinking, some others may think of quitting, but you will also find someone who will stay on until the problem gets cracked.

Speed in problem solving is even more important than the solving of a problem. In every disaster, the test of our capacity lies in the speed of our response in dealing with the ensuing crisis. Disaster managers face a variety of problems,

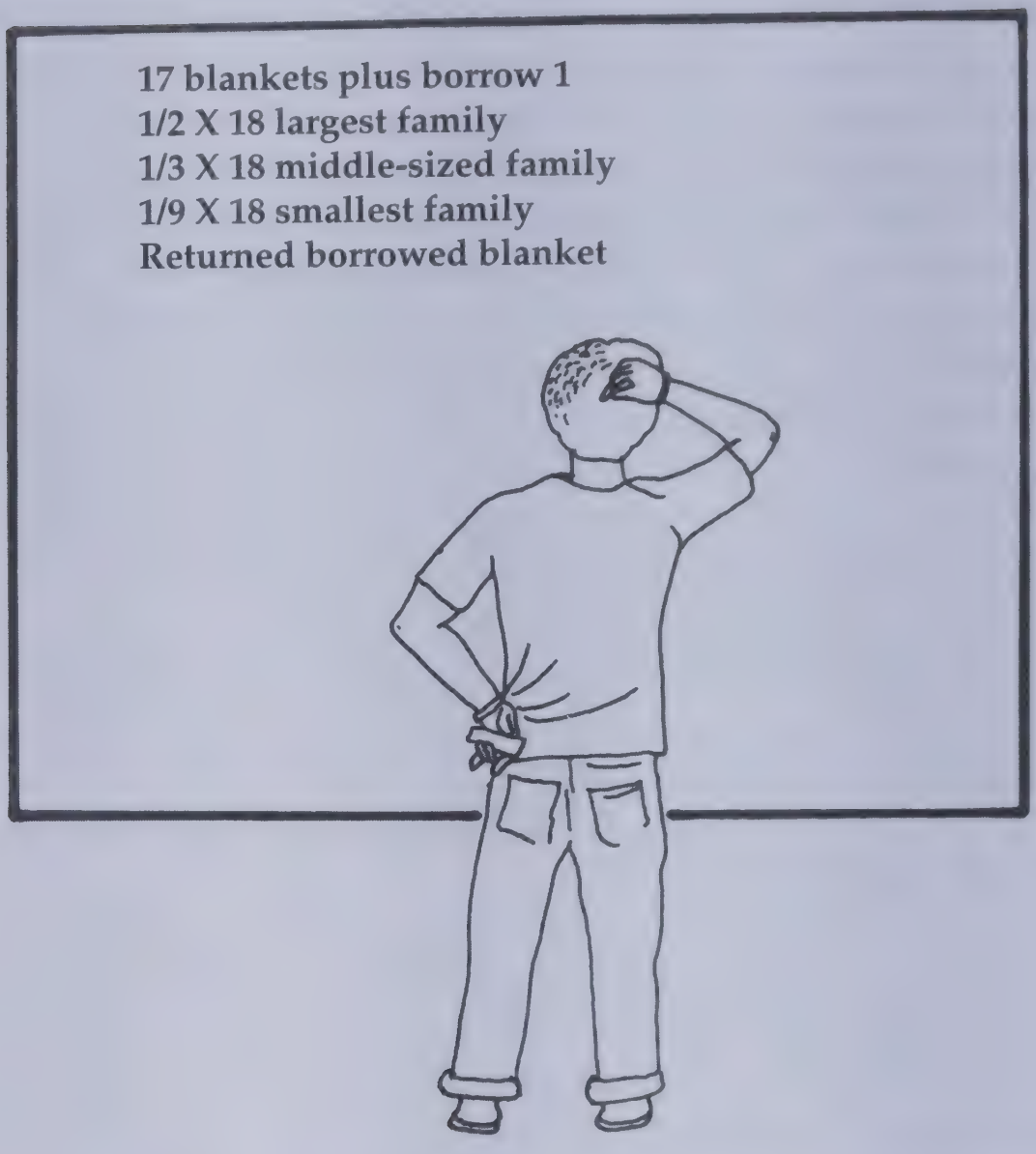
Sir, during relief distribution according to the pre-determined formula, half of the (remaining) 17 blankets were meant for the largest family, one-third of 17 for the mid-sized family and one-ninth of 17 for the smallest family. There was no way the disaster manager could have divided 17 blankets into one-half, one-third and one-ninth. Without any solution within sight, the delay fuelled tension among victims in the relief camp. Could you have found a way out?

some of which appear intractable. One such problem came to light during relief distribution in the aftermath of a tropical cyclone. It was winter time and a large number of the homeless were without blankets. Since the demand for blankets exceeded supply, it was decided to distribute blankets strictly following a pre-determined, transparent formula. While the distribution of blankets to those in the relief camps was in progress, the managers suddenly realised that only 17 blankets were left and if the prescribed formula was to be used, distribution to the remaining three families of victims would not be possible. As per the formula, half of the remaining 17 blankets were meant for the larger family, one-third of 17 for the mid-sized family and one-ninth of 17 for the smallest family. There was no way he could divide 17 blankets into one-half, one-third and one-ninth. It is impossible, said the manager to his boss.

Without any solution within sight, the delay fuelled the tension in the relief camp.

A junior assistant, who had no formal education or training, stepped in and offered to show the way out. Upon seeking permission to act, he went on to borrow one blanket from one of the victims in the relief camp to raise the tally of blankets on hand from 17 to 18. He then used the very same formula to give 9 blankets to the largest, 6 blankets to the middle-sized and 2 blankets to the smallest family. All these added to 17, with one blanket to spare which was then returned to the victim from whom it was borrowed.

There are many other examples of problem solving by ordinary individuals where superior brains have failed. Let us recall an incident that relates to post-disaster lootings of victims. Two persons were caught by the police red handed, arrested and locked up in a prison cell for the alleged crime. Although they were caught in broad daylight in the glare of media, it was hard to prove their crime in the court of law without solid proof because both of them vehemently denied


17 blankets plus borrow 1
1/2 X 18 largest family
1/3 X 18 middle-sized family
1/9 X 18 smallest family
Returned borrowed blanket

Every problem has a solution. All you have to do is to think about it. Albert Einstein once said, "Nothing pains some people more than having to think. If I had an hour to solve a problem, I would spend 55 minutes thinking about the problem and five minutes thinking about the solution."

their involvement in the lootings. What is worse, the police could not even find circumstantial evidence or eyewitnesses.

The minister-in-charge of prisons was very keen to find a way out, but could not see a solution. He then hand-picked two of his very bright officers and asked them to think of a solution.

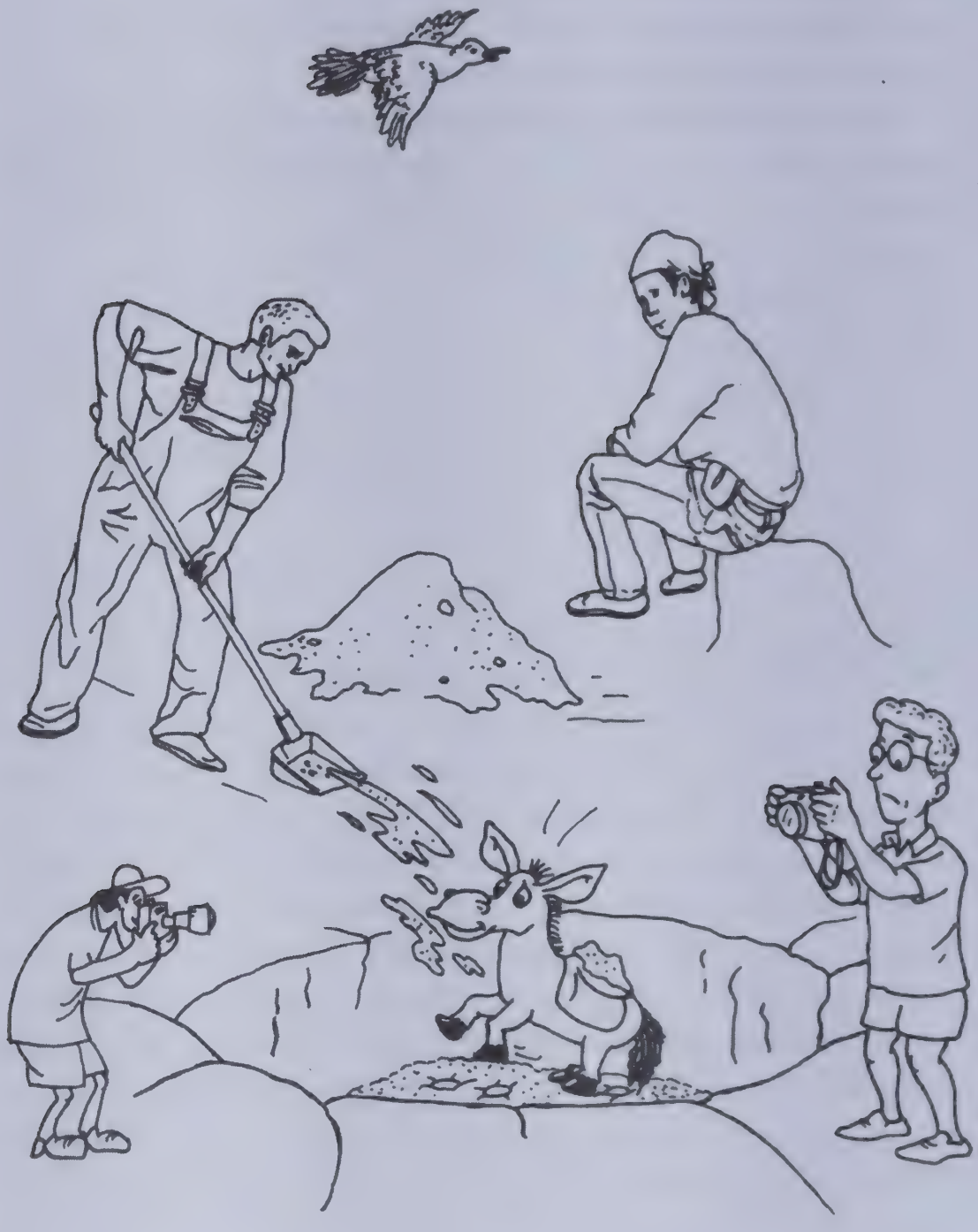
The senior and most experienced officer was of the view that since the crime cannot be proved in a court without clinching evidence, it is futile to keep the two prisoners in Jail, they should be freed forthwith.

The junior and less experienced officer was still thinking and sought permission to try out an experiment. After the permission was granted, he placed the two prisoners in separate cells and spoke to them individually. Each of the prisoners was informed that according to a local law, the one who confesses first will get only half of the usual six year jail term. And the one, who misses this golden opportunity to do so will get twice the term in jail, if found guilty. It was an offer only fools should reject, said the officer.

Both the prisoners, not knowing what the other would do, confessed their crimes to benefit from the possible reprieve. Little did they realise that by maintaining denials, both of them would have gone scot-free!

Most problems get solved also because of the power of positive thinking. There was a small family consisting of an old man, his wife and a child who earned their livelihood by rearing cows and goats and selling milk in the local market. They also had a naughty, smart mule. The years rolled by happily. One day, by accident, the mule fell into a very deep open pit left unprotected by careless and irresponsible construction workers of the local municipality. The old man tried every possible trick in the book to rescue the mule out of the pit, but was not successful. But he was a man of grit and positive thinking, determined not to give up. He turned to the onlookers for help. That also did not work. Nobody was willing to take the risk of going into the pit to rescue the mule as the walls of the pit were steep and unstable. The poor mule continued to toss, turn and cry in pain. Onlookers also began to leave one after the other, suggesting that the mule should be honorably buried with the chanting of prayers.

The old man and the mule were intimate friends. The



The mule was finally rescued from the deep pit by following a novel plan . The master who shared a wonderful chemistry with the mule asked him to shake off the sand poured on him and step up, every time. The pit bottom gradually decreased in depth in this way, and the mule was rescued.

chemistry between the two was so perfect that both could communicate with each other by body language. Both decided never to give-up. It was at that time that the old man hit upon an innovative rescue plan. He asked his wife, son and friends to bring buckets of dry sand from the nearby riverbed and stack sand close to the pit. When people saw this happening, a rumour spread around that sand is being brought for the burial of the mule. Within minutes, more than one hundred people assembled, some of them with children, to take part in the burial ceremony and got ready to pour a bucket or two as a token of their participation in the burial. In fact, many of them started talking about the happy memories of the departing mule and writing his obituary. Very soon, however, they realised that piling of sand was only a part of the old man's rescue plan. When the heaps of sand were in place, the old man instructed the mule to shake off the sand when poured upon him, and step up. He repeated this instruction at least half a dozen times to be completely sure of its compliance. He then started pouring the sand over the mule.

As instructed, the mule shook off the sand and stepped up each time a bucket of sand was poured on him. This process was continued. Everyone could see the mule smartly shaking off the sand as per his master's orders and stepping up. Within the next few minutes, the mule was out of the pit bringing a huge sigh of relief and joy to one and all.

Alice Hoffman in Practical Magic has rightly said, "Every problem has a solution."

13

DOES THE FAULT LIE IN OUR STARS?

Who should be blamed for the disasters which so frequently trouble us? Ishita asked her teacher.

Teacher: Every disaster is unique and so are the combination of factors causing it. Only after scientifically investigating a disaster in all its varied aspects, can we assign the blame. Most of the disasters happen because of our inability to anticipate the danger and prevent it, and because of our failure to manage disasters.

Ishita: We may not be able to anticipate hazards like earthquakes and volcanic eruptions, but hazards like cyclones are nowadays being predicted fairly accurately. I think disaster mismanagement is the prime reason. The other day I read that cyclone Bhola of 12th November 1970 was the deadliest ever in Bangladesh (then East Pakistan) which killed as many as 500,000 people just because of the apathy of the Pakistani government led by its President Yahya Khan, and the sloppy rescue and relief operations.

Teacher: You are right. Also, did you read about Hurricane Katrina, which struck New Orleans in the United States on 29th August 2011. As you said, forecast of Katrina was also accurate and timely and yet the damage was heavy and widespread. Two days prior to the devastating event, the hurricane was known to be a category 4 storm. The city levee was known to be vulnerable by overtopping and flooding. The forecast of severe flooding was also known

hours in advance of the landfall. And yet the disaster was heartrending.

Ishita: Why so?

Teacher: The disaster was largely attributed to its mismanagement by the US government. When the Hurricane actually struck, the American President was on a vacation in Texas and later he went to attend a commemoration ceremony at Coronado in California rather than attending to the hurricane. It was not until 31st August that he flew over to get a bird's eye-view of the devastation.

His Secretary of State Condoleezza Rice made a candid confession of this lapse in her 2011 auto-biography *No Higher Honor-Memoirs of My Years in Washington.* "She did not think much about the dire warnings of an approaching hurricane called Katrina. She was seen at a Broadway play, Spamalot and at Ferragamo buying shoes!"

Ishita: This is sad and shocking. Do we have a similar example from India?

Teacher: Several. We not only misread the trajectory of the Orissa Super cyclone, but also mismanaged it. Let me, however, cite the example of the Bengal Cyclone of 16th October 1943 and quote Dr Syama Prasad Mookerjee who made the following statement before the Bengal Legislative Assembly on 12th February 1944.[1]

"Shooting of innocent people, looting and destruction of property, instigating one community against the other, attacks on women, these are amongst the charges that reached us from various independent sources, many of whom lent no support whatsoever to any subversive movement. Detailed information was handed over to us, including lists of houses that were raided and burnt by or under the direction of the police and the military. I handed over one such long list to

1 The complete statement appears in the book 'Leaves from a Diary' authored by Syama Prasad Mookerjee and published by Oxford University Press, 1993, Appendix V, pp. 213-225.

some of the highest officials in the Home Department on the very day of the fateful cyclone of 16th October and urged them to see that the barbarous acts complained of, came to a stop immediately.

Then came the terrible blow from nature on 16th October last. One would have thought this natural catastrophe, which had caused such enormous destruction of life and property, would also serve to wash away all the bitterness and the sore from the minds of the officials and local public alike and bind them together in a noble determination to alleviate human suffering. The callousness that I witnessed on the part of some of the officials from the highest to the lowest in the face of this terrible blow was something unparalleled in the annals of civilized administration. We have been taught to hate Nazi horrors. But the horrors of oppression under British Rule that Bengal and India witnessed during the last five months compare very favourably with the reports that British propagandists circulate about Axis tortures in lands under their occupation."

On an earlier occasion, in his telegram to the British government on 17th December 1896, Lord Elgin said, "We venture to recommend no action be taken in England in regard to subscription for the relief of distress in India until the situation has more fully declared itself. Definite decision depends upon winter rain."

Ishita: That is pretty shocking. You had taught us earlier that hazards like earthquakes, volcanic eruptions, tsunamis and lightning are natural and will continue to occur but disasters are chiefly man-made and can be prevented. Can you please explain?

Teacher: Natural hazards such as earthquakes, tsunamis, landslides, volcanic eruptions, avalanches, floods, hurricanes and lightning are usually associated with atmospheric, geologic, seismologic, volcanic and such other natural factors over which we have little control. Man-made disasters are

usually associated with anthropogenic factors, especially the industrial, biological, chemical, nuclear, technological, mining, transportation and other such causes. Disasters at Hiroshima, Bhopal, Chernobyl, the Exxon Valdez and Fukushima are some of the examples for which we have to be accountable to posterity. Generally a hazard is allowed to turn into a disaster, and a disaster is allowed to turn into a bigger disaster, because of lack of planning, absence of capacity and preparedness and delayed response; they all add to disaster mismanagement.

Ishita: Why do we often end up cursing our stars and blaming our bad luck for whatever happens?

Teacher: The term disaster itself literally means ill-starred. It is made of two words, namely, *Dis* and *astrum*. Dis means without and astrum means star. The term stands for all sudden and calamitous events producing material damage, loss and distress. Those who survive tend to link their survival to the blessings of the divine and those who get killed to the curse of God. However, the scientific study of disasters does not prove this.

Ishita: That is jolly interesting. The other day, while reading Julius Caesar, I came across a quote of William Shakespeare, who while addressing Brutus said, "The fault, dear Brutus, is not in our stars, but in ourselves". I tend to agree with the quote and wonder why people do not accept this and move on to correct their faults?

Teacher: People do not want to accept this because only few can see their faults and fewer of them have the courage to accept their lapses and faults. They quickly spot out a few facts from here and there as the disaster unfolds to convince themselves and others that it was good fortune that saved lives and bad luck that some others got killed. I recommend you read the letter Charles Darwin wrote to his sister Caroline, regarding the Chilean Earthquake of 20th February 1835. Let me

read it to you from my class notes and particularly note the last three lines:

"We are now on our road from Concepcion. The papers will have told you about the Great Earthquake of the 20th of February. I suppose it certainly is the worst ever experienced in Chili (sic). It is no use attempting to describe the ruins— it is the most awful spectacle I ever beheld. The town of Concepcion is now nothing more than piles and lines of bricks, tiles and timbers— it is absolutely true, there is not one house left habitable; some little hovels built of sticks and reeds in the outskirts of the town have not been shaken down and these now are hired by the richest people. The force of the shock must have been immense, the ground is traversed by rents, the solid rocks are shivered, solid buttresses 6-10 feet thick are broken into fragments like a biscuit. How fortunate that it happened at the time of day when many are out of their houses and all active; if the town had been overthrown in the night, very few would have escaped to tell the tale".

Ishita: It is good to thank fortune but that should not deflect us from probing deep into the causes and affix responsibilities. I had also read Aristotle, who wrote in Ethics: "Divine Providence coincides with the operation of natural causes". In our country we had the Great Bihar-Nepal Earthquake on Monday the 15th January 1934. According to Mahatma Gandhi, "In point of distress, nothing perhaps has surpassed the Bihar calamity in India within living memory." Despite its huge size, however, people felt fortunate because the earthquake had struck at 2:13 pm when most people were awake and outdoors. But then surely there must be examples which counter such a belief? Why do we not speak holistically?

Teacher: Most statements are half truths, whereas we need to go to the bottom of the truth. The Lisbon earthquake struck on Sunday the 1st November 1755 at 09:40 a.m. on All Saints' Day when most of the people of Lisbon were praying

in Churches, and outdoors. Why then was the death toll 30000? In another case, when the Japanese attacked the Pearl Harbour on a Sunday morning, the Americans were either piously worshipping God in the church or recovering from the excesses of Saturday night.

Ishita: Clearly we should look inwards, introspect and decide how we should learn from past mistakes and manage disasters efficiently, in case they cannot be prevented. I know that the effort would involve the whole range of initiatives and actions, including policy formulation, strategic planning, administrative, financial, legal interventions and decision making with particular reference to the entire disaster cycle. We will have to be efficient at rescue, relief and rehabilitation in the immediate aftermath of a disaster. Is my understanding correct?

Teacher: You are okay, but we should try to shift our focus from mere problem solving to establishing the culture of safety. There should not be any hiatus between our scientific and operating tempers. I want you to ponder on Albert Einstein's quote: "I cannot imagine a God who rewards and punishes the objects of his creation, whose purposes are modeled after our own—a God, in short, who is but a reflection of human frailty. Neither do I believe that the individual survives the death of his body, although feeble souls harbour such thoughts through the fear of ridiculous egotisms.[2]

Ishita: Thank you Sir, you have given me enough food for thought. In the coming weeks, I will go deeper into the question — Does the fault lie with our stars or with ourselves?

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2 Albert Einstein (1874-1955): Quoted in The New York Times obituary on 19th April 1955.

14

ETERNAL VIGILANCE IS THE PRICE OF SAFETY

In a lush green hilly remote village in the Himalayas, the inhabitants assiduously mastered the art of averting disasters and living in harmony with Nature. The culture of safety and respect for environment ran in their blood veins. It was hard work spread over a period of generations. Old buildings in the area were made lightning, earthquake, landslide and flood resistant and no new hazard-unsafe constructions were allowed any more by enacting new laws. The emergency management plans of the families, the communities and of the village as a whole were periodically rehearsed and the communities were empowered to act at the slightest premonition of any danger seen from any direction. Even physically challenged people, the elderly and the children were trained to escape danger and attend to the injuries of the victims. Godowns were created to store enough food for emergencies. Water was very economically used to ensure adequate water supply to face famine and fire disasters. Mountaineers and tourists to Mansarovar passed through the village and it is through them that the whole world came to know about this out-of-the-ordinary village, despite the severe handicap of its poor connectivity to the main highway and to the rest of the world.

Decades rolled by, hazards came and passed off without causing any significant harm to any part of the village. The village attracted so much attention that it was declared by the

government as a model village and hundreds of people of the neighbouring villages and trainees came to see for themselves its disaster management capacity and understand the way disasters were averted in the past despite vulnerability to lightning, earthquakes, landslides and floods. Nothing much happened when earthquakes struck because all the buildings in the village were earthquake-safe. Landslides were not even allowed to develop by a stitch in time and by following healthy land use and land management practices. The drainage system in the village was so good that only limited flooding occurred during cloud bursts, which too receded fast without destroying agricultural crops or disrupting the communication systems. The village built a high reputation for looking after its own safety and hardly needed any external help to solve its local problems. In fact the village was also preparing itself to face other types of hazards such as fire hazards, heat and cold waves and drought.

One day the villagers were badly shaken by an earthquake at midnight when most people were asleep. This happened to be an earthquake with a magnitude exceeding 7 on the Richter scale, much higher than ever expected or witnessed in this region. In terms of energy levels, major earthquakes of this magnitude are considered as destructive as an atom bomb. The village being hilly, the earthquake also triggered landslides. And the landslides in turn blocked roads. Some of the houses in the village were slightly damaged but surprisingly the newly built school building completely collapsed, killing 9 children and 3 others. The radio flashed the news of widespread devastation. Outside help, however, did not arrive because of the poor connectivity and absence of any formal linkage, agreements or understanding with the outside world. Delays in response occurred also because external help first went to the more needy neighbouring villages which had suffered much higher levels of damage.

Upon investigation, the collapse of the school building

was attributed to unsafe design and poor construction by the builder. Those guilty were punished and enforcement of building codes was tightened. It took eventually about one year for the village to limp back to normalcy.

Many years passed happily thereafter without any untoward incident and the attention of the people naturally got diverted to their respective businesses. As the population grew and industry came in, the land use controls began to slacken. Natural water bodies were diverted to meet urbanisation needs and for generating hydro-power. New constructions began to appear everywhere on filled-up ground and on old unstable lands. The mandatory periodic safety committee meetings and mock-drills were also gradually forgotten. Villagers hardly spoke about the multiple hazards to which they were once so vigilant and were still highly vulnerable.

Several decades later, one day when people had gathered in the village hall for a public function, a major earthquake struck with violent shaking. It was of even higher magnitude than the previous one. The floor of the hall, in which hundreds of people had gathered, began to sink; its columns were seen to crack and the roof of the hall came down crashing. There was a stampede and most of the disaster management experts were among those either killed or hurt in the stampede. Many other newly built buildings also collapsed like a pack of cards, killing hundreds. Signs of gloom and doom were seen in the village once lauded for its disaster free record.

The villagers were truly aghast because their houses were certified by experts to be earthquake safe and the earlier earthquakes had done no such damage.

Why such a thing happened? Why this time the experience was so different and so hurtful? Where did they go wrong? What should be done to reduce long term risks? These are some of the questions which began to agitate the minds of the villagers.

Indepth investigations revealed that the catastrophe occurred because, the earlier success and applause went into the heads of disaster managers and repeated acclamation made villagers forget the basic grammar of disaster management. Hazard maps and disaster management plans which were earlier regarded as the work in progress, neither came up for scrutiny nor were updated, for years. The buildings collapsed because, the buildings were not retrofitted, ignoring the warning provided by the previous earthquake. The attention which ought to have gone to up scaling the disaster management capacity instead went to seek publicity and preaching others. It was wrong to stop mock drills and assume that people knew all that was needed to be known. It was not realised that the new population of children was never part of any awareness campaign or an evacuation drill in the past. Builders and architects merrily continued designing structures, ignorant of building code revisions or advanced training in structural and geotechnical designs.

It all came as an expensive lesson for the villagers but they vowed to rise again from the ashes. They converted the disaster into an opportunity to build back better and safer, and worked ceaselessly towards reviving the culture of safety. There has been no disaster in the village since then.

Many of the villagers had heard the phrase, "Eternal vigilance is the price of safety" but it is for the first time they realised its profound significance, especially in the context of safety against disasters. The phrase was originally given by Thomas Paine, who also said, "Those who expect to reap the blessings of freedom must, like men, undergo the fatigue of supporting it."[1]

Nothing can be more true than these words of wisdom!

1 Thomas Paine: The American Crisis, No. 4, 1777.

15

THE CHARADE OF DISASTER RISK EVALUATION

This story is of a secondary school in an urban town which introduced the subject of disaster management in the teaching curricula for the first time. One day, the class teacher laboured very hard to explain to the students the importance of anticipating the hazards they face and learn the art of quantifying those hazards and estimating the risks involved. Students were told that since the school is located in a mountainous area, it faces the threat of landslides, earthquakes, floods, thunderstorms and lightning.

The teacher began with the perceived threats due to landslide hazards, which were feared the most. Each student was given a simple, colourful landslide hazard map of the area showing the clearly demarcated boundaries of very high, high and low landslide hazards. The location of the school was also prominently shown on that map and students were expected to identify the level of hazard faced by the school. Most students correctly read out low hazard, and felt confident in map reading.

The teacher then invited questions.

Rohan: Madam, how do we know that this hazard map is reliable?

Teacher: Yeah. I must frankly admit, it is not reliable; it has been drawn just for teaching purposes.

Rohan: But Ma'am, you should give us a reliable map

so that we really know the level of hazard at this location, and prepare accordingly.

The teacher promised to come back with a reliable landslide hazard zonation map of the area.

The revised hazard map was distributed in the next class, and the teacher then asked students to repeat the exercise done in the class, last time.

It is a low hazard zone, replied most of the students.

Surbhi: So the situation has not changed and it is happy news for the school, but please tell us what is the basis of preparing this hazard map?

Teacher: The map takes into account factors such as geology, geomorphology, topography and hydro-geology of the area. The land use patterns, slope management practices, rainfall and seismicity of the area have also been considered. You should read about these factors from the handouts before we meet again after the vacation.

The school was closed for vacation. During vacation time, students got the sad news that their school building had been destroyed by a massive landslide. The news surprised the students all the more because their understanding was that the school fell in the area of low hazard, as per the landslide hazard map they had read.

A few weeks later, the school reopened in a hired building, not very far from the old school. The students could not resist their curiosity to know why the school building was destroyed by a landslide despite it being in the zone of low hazard?

Ishita: Ma'am, The reliable hazard map you gave us last time has proved to be dangerously unreliable. What is the use of such a hazard map?

Teacher: The hazard map you saw last time has now been withdrawn. It was inaccurate because it had ignored factors such as climate change and freak meteorological events, urbanisation, environmental degradation, non-engineered

construction, worsening conditions of drainage and many other such factors.

Ishita: When will you give us the correct hazard map, revalidated for this new location of the school?

Teacher: No such map is available right away and the experts say that they will need a couple of years to produce such a map for us, if ordered now.

A year later, a major landslide tragedy struck the State of Uttarakhand in India. Having known about hazard maps, the students wanted to know if reliable landslide maps were available at least for Uttarakhand, a state known to be highly prone to landslides.

Teacher: "Yes and No". Yes, because a number of institutions have been producing landslide hazard maps of Uttarakhand for the last few decades, and No because none of these maps account for all the various factors which ought to have been recognised.

Ishita: Why do we do such mapping work without relevance or utility?

Teacher: Unfortunately, there is a gross disconnect between our scientific discourse and our approach to hazard mapping. In scientific discourse, we dread factors such as climate change, exceptional rain, receding of glaciers, bursting of glacial lakes, poor road alignments, non-engineered constructions, earthquake-induced landslides, and overtopping of dams, while in hazard mapping, we disregard all these factors and only account for Lithology, Structure, Slope Morphometry, Relative Relief, land use/land cover and Hydro-geological conditions. We need large scale, validated and user-friendly hazard maps based on a scientific understanding of the multitude of factors, both natural and human-induced.

Surbhi: That's terrible. In my view, we must stop circulation of such hazard maps, if not certified by the experts as reliable.

Teacher: I entirely agree with you, but that is the best we know at this time. It could have been worse.

Meena: How?

Teacher: As you would realise, landslides are not the only hazard we face. The school is concerned about its safety regardless of the type of hazard. Like landslide hazard maps, experts also produce flood hazard zonation and earthquake hazard zonation maps. We therefore need reliable multi-hazard maps without which reliable risk evaluation is not possible.

"This is the situation as of today. Now, can any one of you summarise, what you have understood?" asked the teacher.

Ishita: We face multiple hazards and all these need to be considered together to evaluate the actual level of hazard and risk at a given location. We only have maps of individual hazards so far, the reliability of which is yet to be certified. We do not have multi-hazard maps as yet and therefore no reliable hazard and risk assessments are possible. Hope this situation will change sooner than later.

"God save us all," came the voice!

16

THE FEAR OF ZERO TOLERANCE

We all know , "Earthquakes do not kill people, bad buildings kill them". Why then do we continue to allow unsafe construction? One of the main reasons is that those who build unsafe constructions have neither accountability nor fear of punishment because no one ever gets punished.

Nearly 4000 years ago, King Hammurabi used the policy of zero tolerance to guarantee safe buildings for all. For those who do not know Hammurabi, he was the sixth King of Babylonia during (c. 1792-1750 BC)[1] in the State of Mesopotamia, now Southern Iraq.

Hammurabi ruthlessly enforced a set of all-inclusive Codes of Law in Babylonia, called Codex Hammurabi, and demonstrated that by zero tolerance against failures and by punishing the guilty, safe buildings can be achieved on the ground. Of the 282 codes, six were exclusively devoted to zero tolerance against faulty construction. For instance, when a builder was found guilty of constructing a building that killed the owner, then the builder himself was put to death. If the owner's son was killed, the builder's son received a death sentence in punishment. So ruthless was his implementation of codes that he created about an 8 foot high stele of black diorite and engraved the codes on it. These were for everyone to see and follow without exception so much so that he

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1 Source: Claude Hermann Walter Johns (1904): Babylonian and Assyrian Laws, Contracts and Letters (New York-Charles Scribner's Sons, 1904).

King Hammurabi, the sixth King of Babylonia during (c.1792-1750 BC), succeeded in ensuring safe buildings, nearly 4000 years ago, through the policy of zero tolerance and fear of punishment. He accepted no excuses, explanations and justifications, making his an eye for an eye approach abundantly clear. He did not even spare those who were unable to read.

himself did not have the authority to change any one of the laws. He accepted no excuses, explanations and justifications making his *an eye for an eye* approach abundantly clear. He did not even spare those who were unable to read. Those of you who are interested to see the stele, please visit the Louvre Museum in Paris.

Today we have well considered codes and laws backed by years of experience, but their implementation leaves much to be desired. The engineers, architects and builders invariably hide behind loopholes in laws and explain away the failures in terms of their fractured responsibilities. Since the roles of engineers, architects and builders are fungible, particularly when it comes to the erection of buildings and housing, it is seldom possible to fix responsibility.

Let us listen to the following conversation Sir James Courlett[2] had with a builder.

"You are a builder, I believe,?" asked Sir Courlett.

"No, Sir; I am not a builder; I am an architect," came the reply.

"Ah well, builder or architect, architect or builder-They are pretty much the same I suppose?" remarked Sir Courlett.

"I beg your pardon, they are totally different," responded the architect.

"Oh, indeed! Perhaps you will state wherein this difference consists," said Sir Courlett.

"An architect, Sir, conceives the design, prepares a plan, and draws out the specifications. In short, supplies the mind. A builder is merely the machine; the architect the power, that puts the machine together and sets it going," replied the architect.

"Oh, very well, Mr Architect, that will do. A very ingenious distinction without a difference. Do you happen to know who the architect of the Tower of Babel was?" responded Sir Courlett.

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2 Biographic Dictionary of English Architects.

"There was no architect Sir, Hence the confusion!"

Imagine by zero tolerance against flouting of building codes we can save thousands of lives. Zero tolerance is fine, but perhaps not the Hammurabi way! Do you think that by putting the fear of punishment in place, things will change on the ground?

Ideally speaking the deterrent like zero tolerance and fear of any kind is never a good thing in life and the lasting change in us must come not out of fear, but out of change of heart and the mindset, and out of love for doing the right thing. Francis Bacon was not kind to the fearful when he said, "To suffering there is a limit; to fearing, none." Ernst Thompson Seton called fear a truly dangerous enemy when he said, "The worst thing you can do is to get frightened. The truly dangerous enemy is not the cold or hunger, so much as the fear."

We live in the real world in which fear and safety are intimately interconnected. For example, without accountability and fear of sorts, a careless lawyer is more likely to send the accused to the gallows, the same way as a careless doctor can send a patient to burial by his neglect. Where there is no fear, complacency enters from the back door eventually to take over, and stifle safety. Although the fear through zero tolerance can lead us to safer buildings, but it is only by transformational changes in us that we can achieve the culture of safety.

Henry Tweedy was of the view, "Fear is the father of courage and the mother of safety" The real truth is that courage and fear are arch rivals and indeed fortunate are those who have the guts to be in the company of the worst of fears on one hand and the moving ultimate in courage, on the other hand.

The road to these ideals pass through the fear of zero tolerance.

17

WHO ARE MORE VULNERABLE TO DISASTERS—WOMEN OR MEN?

Imagine, you are a witness to a roundtable meeting arranged by an international organisation to expressly flag the issue of the heightened vulnerability of women to natural disasters and to discuss who is more vulnerable-women or men? The deliberations went on like this:

Chairman: There were times when disasters were considered gender-neutral. Just as the Sun gave equal light and rain gave equal water to all, disasters were seen to hit people of all sexes, of all ages and of all creeds and colours, equally. As our understanding of disasters increased, it became increasingly clear that natural hazards are gender-neutral but natural disasters are not. This was because for the same level of natural hazard, women were found to be more vulnerable than the men folk. The higher vulnerability of women is chiefly because of the lack of adequate attention to their capacity development and empowerment. It is also because of their non- involvement in the decision making process.

Antony: Gender-mainstreaming in disaster management was never at a greater focus than what we find today. It seems to have become a popular theme for roundtables, conferences, symposia and workshops. Do we have any new stuff to discuss or else we may eventually end up rediscovering an inferior wheel.

George:We lack quality information and reliable studies. I do not agree that it will be fair to conclude merely on the basis of statistics of a few disasters that women are more vulnerable than men. I have statistics of many disasters which killed more men than women. One should see the absurdity of drawing conclusions based on hand-picked statistics that fall in line with a pre-determined point of view. There are people who naturally reel out statistics of worst-case disaster scenarios, for example, to prove that children are highly vulnerable to collapse of school buildings. No wonder, when school buildings collapse, the toll of school children is bound to be the highest.

Ishita: Gentlemen, I knew even before joining the meeting that someone will be there, as it happens at every such meeting, to shoot the messenger. I do agree that people have pre-conceived ideas and look for statistics that support their idea. But more than that, it is a question of the attitude of men towards women.

David: Oh, No, that is grossly unreasonable. Tell me if an earthquake were to come just now and knock down this very building to kill us all, naturally more women will be killed because they happen to outnumber the men folk at this time. Does that prove that women are more vulnerable than men? Let us not forget that in this case, the vulnerability of all of us will be 100% if the building collapses and 0 %, if it does not.

Geetha: It is all in the books. I do not think we are reaching anywhere. It is sad that arguments and oratory skills are being misused to justify a particular point of view. We should have a very broad picture in mind, consider diverse situations, study well documented case records and involve women in the decision making process at the highest level. You gentlemen seem to have no idea about the plight of women.

David: It is less than fair to men when one begins to doubt their integrity at the outset. Rather women should

acknowledge with gratitude that hundreds of men put themselves in the line of fire and rescue disaster victims, making no distinction whatsoever between sex, age or colour. Men do everything possible to save the lives of their spouses even at the expense of their own. Am I not correct?

Geetha: Do not tell us. Many men I know are constantly on the lookout for such opportunities to get rid of their spouses!

Suresh: Geetha, please do not trivialise the matter, I beg. We are not responsible for the company you keep.

Meena: I object. Here, we should talk about capacity building and the empowerment of women to reduce their vulnerabilities. You must know that nearly 90% of women succumbed to storm surges in the Bangladesh cyclone because they did not know swimming.

Ramesh: How did one find out this? Tell me how many of the menfolk survived the same cyclone because they knew swimming?

Geetha: This will take us nowhere. I guess the whole point is to improve skill levels of women, invest in their training and retraining, and involve them fully in the decision making process.

Chairman: I entirely agree. I always love to respect women's point of view and hope one of you will convey this to my wife as well when you meet her next. Having said that, I believe reducing vulnerabilities against disasters is team work in which men and women should become equal partners. Weaknesses in our system, wherever they are found, should be removed. Devolution and empowerment are essential for disaster risk reduction and if women lack the skills or empowerment, we should all facilitate that giving it to priority. Remember that we have to co-exist on the same planet and everything possible should be done to close gaps in the way we perceive the problems, and achieve harmony. We should think of a new law to punish wrong doings.

Mary: Am I to understand that we will have to wait for a new law for things to change? Why not improve upon the existing laws? We need to quickly address the suffering of women.

The meeting adjourned for the next session.

18

TAKE THE BULL BY THE HORNS

People of a village were badly shaken by a monster who frequently appeared out of nowhere to scare people, destroy trees, pollute water tanks and even kidnap children in broad daylight. People were so scared of him that they did not have even an ounce of courage to resist and fight the monster. There were scenes of gloom and doom everywhere and people found themselves totally helpless and orphaned.

One day a holy man passed through the village and he was taken aback by the graveyard silence he found everywhere in the village. He naturally inquired about the cause of such stoic silence and despair.

We are being hounded by a dreadful monster, said the Village headman. The holy man wanted to know exactly what was being feared?

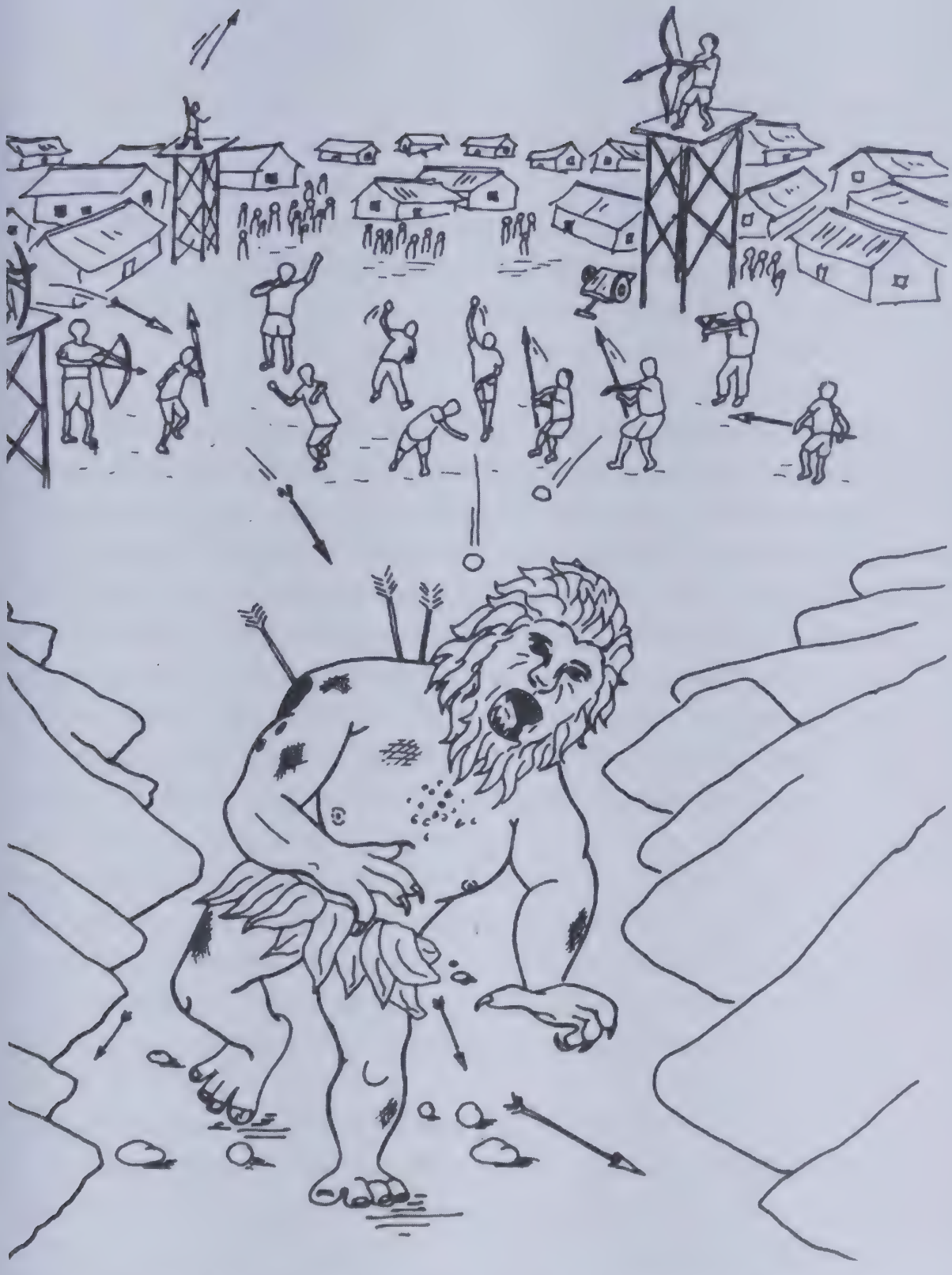
The news of the holy man's arrival spread in the village and slowly people began to gather around him, seeing a ray of hope.

Holy man: Why do you all not unitedly hit the monster hard before he strikes you next time when he comes?

Headman: Sir, he is not only dreadful, he is also too big to hit.

Holy man: That is a very wrong way of looking at things. Tell me, is he also not too big to miss?

The holy man then left the village after asking villagers to think about what he had said, and promised to come again.



The Villagers who first thought that the monster was too big to hit eventually found it too big to miss. The same is the story of disasters. These days they are too big to miss.

Villagers were charmed by the charismatic glow on his face and they could feel a lot of weight in his voice. To many, he looked like a messenger of God, who had come to protect them. Therefore, they resolved to fight the monster unitedly, and began to plan and prepare.

When the monster came the next day, the villagers attacked him collectively from all directions and in every possible way. The monster had never expected it, and was badly hit and therefore, had no option but to run for his life.

He was thereafter seen no more.

The holy man returned to the village and was extremely happy to see the cheerful villagers bowing down to him in reverence. The headman profusely thanked him, requesting for his few words of wisdom. The holy man simply repeated what Swami Vivekananda, a renowned Indian saint, had once said: "I have seen in life—those who are overcautious about themselves fall into dangers at every step; those who are afraid of losing honour and respect, get only disgrace; and those who are always afraid of loss, always lose."

There is a big lesson in this story for all of us. Natural Hazards are like monsters. Monsters of climate change, urbanisation and environmental plundering are staring us in the face. They hit us hard and make natural hazards turn into devastating disasters. We always live in fear and forget that they are too big to miss. Let us remember that although we may not be able to fight them individually, we can reverse the process of degradation, and protect ourselves by our united action.

It is unfortunate that when any problem becomes very big, we quickly come to the conclusion that nothing much can be done about it and continue to suffer the way the villagers did. The monster of disasters will be seen no more the day we collectively resolve and vow to take the bull by the horns!

19

ALL'S FAIR IN LOVE AND WAR

In a remote location, in an inaccessible hamlet in the lofty heights of the eastern Himalaya, there was a monastery. The monks of the monastery took upon themselves the responsibility to educate and train people in the neighbourhood in the art of safe living. The avalanche prone snow clad mountains and the inclement weather forced people to remain indoors most of the time of the year. On every occasion when the weather was good, people tried to take care of their outdoor jobs. The monks took special care to train people in the art of averting disasters and self-protection.

Once the Monastery deputed a young, charming monk to train a newly married couple in the art of personal safety against natural hazards. His lessons included joint as well as separate training sessions. Joint classes emphasised the importance of team work. Among other things, the couple was told that in the event of danger, it is important to ensure personal safety before attempting to save the partner. In the lessons imparted during individual training sessions, the trainer monk asked each of the partners to work towards removing weaknesses of the other partner so as to reduce their respective individual vulnerabilities, thereby enhancing overall safety.

The training ended. A week after the training was over, the lady came to the trainer monk, almost weeping and tense.

When asked the reason, she complained that she was much better off without the training. In fact, the training had turned her life upside down.

Monk: Why so?

Lady: Sir, No sooner had the training got over, I found my husband indifferent and cold. This morning, he told me of his decision to divorce me. He wants to join the monastery as a monk like you so that he too can train couples and others, and while doing so, pick and choose his new life partner. I saw him writing in his notebook: "I think if you do something and it turns out pretty good, then you should go and do something else wonderful, not dwell on it for too long. Just figure out what's next"? When I questioned him on this, he told me that I am pretty good, but he is looking for something wonderful. He has been inspired by this quotation from Steve Jobs.

Monk: You please go back to him and express your happiness at his decision. Tell him that you too are inspired by Steve Jobs, who, for 33 years, looked in the mirror every morning and asked himself: "If today were the last day of my life, would I want to do what I am about to do today?' And whenever the answer has been 'No' for too many days in a row, I know I need to change something." Tell him that the only difference in your case is that you have looked at your mirror only for 33 weeks of married life!

The lady seemed happy at the guidance and returned home, but got back to the Monk, the very same day.

Lady: What I said to him made him happier than before. He seemed to have made up his mind and will not budge. What should I do now?

Monk: Go and tell him that celibacy is fundamental to Buddhist monastic life and he must know that once he becomes a monk, the rule of celibacy will apply to him as well. Tell him that if he still divorces you, your doors for him will shut forever.

The lady returned to the Monk again the next day with a pale face in deep anguish.

Monk: What did he say to you this time?

Lady: He said, "I will cross the bridge when it comes". Moreover, he thinks that the rules of the monastery can always be changed or broken.

Monk: That's a nice insight for me. It clarifies all my doubts. Now then, would you like to marry me? I am ready to swap my position with your husband. All's fair in love and war!

Lady: I'm even more sad. I expect monks to be an example in character building and display equanimity both in love and war. In my judgment, both of you do not deserve to be monks. Still I would like to thank you for giving me an idea and God willing, you will soon see me as a monk, worth the name!

20

FROM SEA OF GALILEE TO THE DEAD SEA

The Sea of Galilee and the Dead Sea are a paired example of what we got and what we have made of it. Why is mankind determined to disgrace Nature in this most despicable manner? When shall we realise that glaciers, forests, lands and water bodies are the most gracious gift of Nature to us? Know this that depletion of glaciers, denudation of forests, degradation of lands and dwindling water bodies are symbolic of our contempt for that exceptional gift.

The Sea of Galilee is synonymous with alluring management by Nature. It is located in the Jordan Rift Valley near Golan Heights in Israel and marks the separation between the Arabian and African orogenic plates. Besides being the prime source of drinking water for Israel, it is also of interest to seismologists. It is like a paradise on land: bristling with life, full of chirping birds, lavish greenery and scenic beauty. The Holy Jordan River, originating in the Jordan Rift Valley, serves the states of Israel, Jordan, Syria and Lebanon. It was on the bank of River Jordan that Christ was baptised. Water filling the Sea of Galilee quenches the thirst of millions of people.

In contrast, the Dead Sea, as its name implies, is dead, lifeless. Located in the Jordan Rift Valley, It looks like a horrifying picture of death trampling over life. It symbolises the gross mismanagement of Nature around us.

However, the right way of looking at all this would be

to see the positive side. Every situation in Nature offers a great opportunity to learn what otherwise might never have been possible. My visits to the Dead Sea, made me see its better part. Being a non-swimmer, the Dead Sea gave me my first opportunity in life to swim simply because sea water is heavier than potable water and that makes swimming akin to floating. Its water is very different from ocean water in terms of its mineral content. As a student of seismology, I found the area exciting for the study of plate boundary between the African Plate and Arabian Plate. I also immensely benefitted from the centers of health research and treatment known for Climtotherapy, Heliotherapy and Thalassotherapy. Dead Sea is a unique laboratory of the world for scientists to investigate how some bacteria and microbial fungi can survive when high salinity prevents growth of aquatic organisms?

The world's attention to this beautiful contrasting region is diverted by warlike situations and terrorism in the region. These are two added threats apart from environmental concerns. Much of what is happening can be traced to the breakdown of trust and effective communication between warring factions. The attention we need to pay to environmental preservation is being wasted in settling scores and disputes. John F. Kennedy, President of the United States of America once said, "If we cannot end now our differences, at least we can help make the world safe for diversity."

The question is about the survival of mankind. Gene Roddenberry provides food for thought when he says, "If man is to survive, he will have learned to take a delight in the essential differences between men and between cultures. He will learn that differences in ideas and attitudes are a delight, part of life's exciting variety, not something to fear."

Let us make the most of what we have on our beautiful planet Earth and learn to enjoy the Sea of Galilee and the Dead Sea as they are, and leave them for posterity as good as they are, if we can't make them better!

21

THE WRITING ON THE WALL

A washer man, called Dhobi in India, lived with his family in a village and earned his livelihood partly by washing others' clothes and partly by selling goat's milk. He found that, things changed very rapidly in his village. More and more buildings, roads and smoking chimneys began to rob the village of its greenery and beauty. People began to afford washing machines and dairies began to deliver milk at home. It became difficult for the Dhobi to make two ends meet. His wife had died a few years ago and as luck would have it, one day his only child also died of malnourishment.

Disgusted, he, therefore, decided to leave the village in search of a place where he could make a new beginning. A donkey, a goat and some utensils were all he had as his wealth. To be sure that no one stole what was left with him; he very carefully tied the goat and the donkey together with a strong rope. He then hung a bell around the neck of the goat to be sure of getting an auto-alert in case of any attempt to steal the goat. As soon as he left the village, little did he realise that a robber was already chasing him with an eye on his goat. When darkness descended, the robber succeeded in cutting the rope and disconnecting the goat from the donkey. While doing so, the robber very cleverly dodged the Dhobi by reconnecting the bell on to the donkey's tail. Dhobi failed to sense the theft because the sound of the bell continued to be as audible as before. It was only when he wanted to halt

The Dhobi (washer man) is preparing to leave his village with his mule and goat for greener pasteurs. He places a bell around the neck of the goat and ties the mule and the goat together to avoid possible theft. The thief looks on.

for the night under a tree that he came to know about the missing goat. That made him restless as he sat on the ground in deep remorse.

A few minutes later, a passerby came to him on his own, introduced himself as Rohan and inquired if he could be of any help. The Dhobi told him of the whole story from Alpha to Omega, cursing the robber of stealing his goat. Rohan instantly brought a glow on the Dhobi's face when he broke to him the news that only a few minutes ago, he had seen a stray goat grazing some 500 yards up the road. Dhobi thanked the man profusely for the information and decided to go back

The thief quietly cut the rope, took away the goat and tied the bell on the mule's tail..

When Dhobi noticed the theft , a stranger misleadingly informed him that he had seen the goat a short distance away, pointing out the direction.

Before the Dhobi could return, the stranger took away his mule, and disappeared.

to recover his goat. The stranger volunteered to look after his donkey and the utensils, until he was back.

Dhobi tried his best to locate his goat, but there was no trace of it anywhere. Suddenly it occurred to him that perhaps he had been duped for the second time by the stranger. He, therefore, rushed back and was indeed horrified not to find Rohan, his donkey and the utensils. The earth began to slide beneath his feet. He felt orphaned and helpless. Somehow he passed the night twisting and turning on the hard ground under the tree.

Next morning, as the sun began to rise, he woke up and started looking for water as he felt thirsty. He could clearly see the distant village a few kilometers away and kept walking towards it in search of a well. After walking for about an hour, he came across a well. There, he found a young man resting under a tree. His name was Jack. Looking at the pitiable condition of the Dhobi, Jack inquired if he

could be of any assistance. Dhobi could not resist repeating the whole story to him with a deep sense of anguish and pain in his heart.

Jack interrupted Dhobi and told him that what had happened to him is most likely the job of the same robber who is hiding in the well. The good news is that there is a bounty on his head and hefty reward money will go to someone who can catch him. If Dhobi had the guts to catch the robber, and hand him over to the police, he would get enough reward money to live happily thereafter. Jack assured his help, all the way.

Upon his return , the Dhobi felt orphaned because he had not only lost the mule and goat, but his belongings too. At that time he met Jack, who advised him to catch the robber hiding in the well , claim the reward money and live happily thereafter.

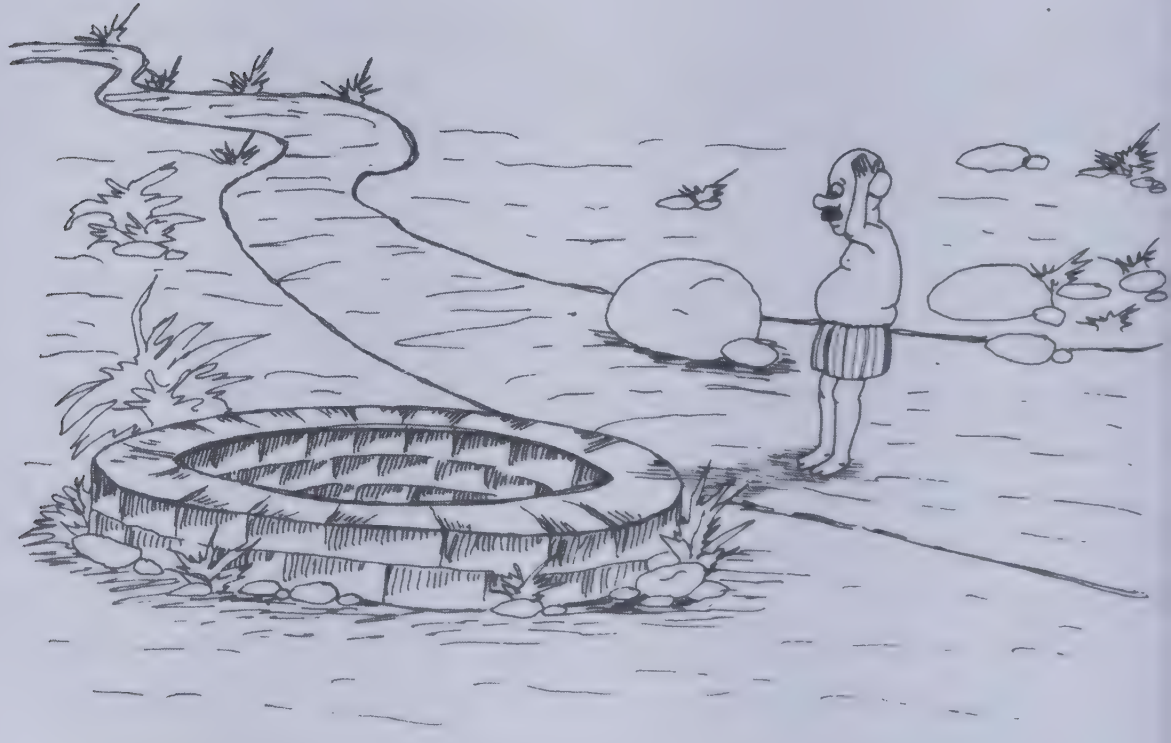
Jack also advised Dhobi not to dirty his dress which he would need while claiming the award money. Following his instructions, the Dhobi removed his clothes before entering the well.

Driven to the wall and lured by greed for the reward money, the Dhobi agreed to take the risk of catching the robber. Jack suggested to him that since he did not have a spare dress, he should save his only dress for future use, by going into the well naked. Otherwise, without a spare dress, how would he go to the police station to fetch the reward money?

The poor Dhobi appreciated the advice, undressed himself and went into the well. He dived deep into the well water but failed to find the robber he was looking for. Frustrated, he gave up the search. When he came out of the well, he was stunned. Jack too had disappeared with his clothes, leaving him high and dry!

The story of our planet Earth is more or less akin to the story of the Dhobi. Is it not a crying shame that we are all playing a robber's role in separate ways?

When our forefathers inherited Mother Earth, it was full of pristine beauty. Its forests were lush green; very rich in wildlife, fauna and flora. Rivers carried waters which remained as pure as at its source. Oceans were free from oil pollution and exploitation. Mountains were majestic and inspirational. Things changed for the worse slowly over the centuries because of increasing human greed and exploitation. Today, our skies are polluted; our mountains look barren and our water-bodies are like stinking gutters. With business as usual, it is certain that we will leave a planet which will hardly have any resemblance to what was handed over to us at its start. The question everyone is asking is one



When the Dhobi came out of the well without any success , he neither found Jack nor his clothes . For him it was the end of the world.

of accountability to posterity. This is because no one seems to be prepared to own the responsibility of robbing Mother Earth of its beauty and charm.

The other question being asked is how long will we be able to protect what is left when shameless robbing of our scarce natural resources still continues unabated. If all of us do not unite to check the loot and reverse the trend of degradation, the time is not very far away when we would have lost everything, reaching the point of no return.

It is time we see the writing on the wall.

22

DARING FEATS OF HEROIC RESCUE

The greatest gift of disasters to mankind is that they leave behind great and inspiring examples of courage and valour in rescue. We are able to raise our heads high when we see examples after examples, one excelling the other.

Ingrid Betancourt, a 46 year old Franco-Colombian politician was a candidate for the Presidency of Colombia. She was also a Nobel Peace Prize nominee and the winner of many other laurels and awards. On 23rd February 2002, when Betancourt was campaigning along with her running mate Clara Rojas near the rebel control zone in defiance of the warning, she was taken hostage by the Revolutionary Armed Forces of Colombia (FARC) and kept in captivity for 6 years.[1] The rebel's pick became a news because she was a high profile catch. She spent part of her captivity chained to a tree. Her group was often made to move up to 25 kilometers in a day to dodge possible attempts of rescue by her men, and her camp was heavily fenced and guarded. All she had was access to books like 'Harry Potter'.

On 2nd July 2008, she was rescued by the Colombian armed forces, in a daring feat. Braving the secluded, deep and awesome mountain jungle terrain, *Operation Jaque* (meaning *check*) was carried out with surgical precision and without shedding even a single drop of blood! Colombian

1 It is also known as Colombia's Marxist rebel group, a guerrilla terrorist organisation banned by the United States of America.

Intelligence displayed the ultimate in courage to pierce deep into the rebel's command structure to carry out what could be termed as the boldest rescue plan ever. The plan was based on months of dogged surveillance and vital clues retrieved from computers when the FARC's camps were raided across the border in Ecuador on 1st March, 2008.

The Colombian government authorised the former French Consul in Bogotá, Noel Saez and Jean-Pierre Gontard, a French-Swiss academic, to engage the rebels in a dialogue to work out a humanitarian agreement for exchange of prisoners. Both of them opened the communication channel with the rebels and met Alfonso Cano, a close associate of the new FARC leader at an unknown location in the jungle. Other efforts by the Colombian Intelligence went on in parallel.

The guerrillas guarding the hostages reportedly got orders, as though these were from their superiors, to hand over Betancourt and 14 other hostages to a "humanitarian NGO" who would then take them by helicopter to meet Alfonso Cano, the new rebel leader. The hostages were taken with their feet and hands tied in a helicopter with Gerardo Antonio Aguilar, popularly known as Cesar and one other guerrilla in command.

Things moved swiftly and the hostages had absolutely no clue of where they were being taken. All of them were living in the hope that one day they might be released possibly in a hostage-exchange. Their hopes were momentarily shattered when the hostages found a new set of totally unfamiliar guerrillas at the other end, ready to receive them. Little did the hostages realise that these guerrillas were, in fact, Colombian government commandos in disguise. In a blitzkering move, the tables were turned. The two rebel leaders were overpowered and captured. Betancourt and other hostages were then flown to freedom in a government helicopter!

"Thank you Colombia, Thank you France," were the

words of Betancourt when she stepped out of the military aircraft which brought her to the Colombian capital, after her rescue. "God, this is a miracle," she said. "I am unaware of a precedent to such a perfect mission."

"The voice of President Chavez was the voice which gave us hope. In our darkest moments in captivity, it was the light at the end of the tunnel," said Betancourt. For those left behind, she said, "I want to say to my companions still in the jungle, this would be the last Christmas in captivity. And I want to tell them: have faith. Have faith because there is a chain of love being built across the whole continent which is going to help us get you out of there."

To the rebels, this is what she had to say: "The FARC must realise that there is no place in this continent for the armed struggle, that all of the left wing governments that have been elected in Latin America over the past 10 years have achieved it by democratic means with no need to take hostages and even less need to kill"

In turn, she got a lot of respect. The Green Party speaker Caroline Lucas acknowledged Betancourt's, "personal bravery, moral courage and total commitment to the people of her country" and regarded her, "amongst the most inspirational women of our generation."

The second story of rescue by the display of exceptional courage relates to the rescue of 11 tourists stranded in a cable car 3000 feet above the ground at Parwanoo in the State of Himachal Pradesh of India. The date was 14th October 1992 and the time was 3:30 pm. One of the cables in the car had broken and therefore the tourists had got stranded. According to the then Air Chief Marshall Fali Homi Major of the Indian Air Force (Payal Saxena 2008): "There were a maze of wires above the cable car and using helicopters for the rescue was risky. This was because if the winch got entangled in the wires then it would risk the chopper as also the trapped tourists. We opted for Mi-17, as it had a longer winch. We studied the

construction of a cable car, as we had to open its roof to get the people out. We had a daredevil in our team by the name of Captain Castro, who volunteered to sit on the winch. We opened the cable car and lowered him into it, on the winch. The car was swaying and no one inside could have managed to come up on the roof on his or her own." Five people were rescued that day. Castro stayed with the rest in the cable car for the whole night with blankets and food for those trapped.

Yet another story is of Zhu Fumin, a 15 year old student, who saved as many as 33 lives by his extra-ordinary courage and presence of mind during the Sichuan Earthquake. Despite confusion galore, he kept his utmost cool and asked his colleagues to go under their desks. According to his classmate Dai Yingying, most of his colleagues followed his advice. He then made a slit in the wall through which 33 of the students could escape. This was reported by the Times of India on 15th May 2008.

The list of daring feats of heroic rescue is long and inspiring. The stories scripted by the heroes are a living testimony to the fact that Mother Earth often gives birth to its sons and daughters who redefine limits of courage and human excellence!

23

SERVICE ABOVE SELF

The tallest building in a town was on fire. The flames rose so high that the smoke was seen from a distance of several miles. Fire brigades arrived and the rescue team tried to do its elemental best to extinguish the fire and save lives. Ambulances rushed victims to the hospitals. Hundreds were watching the dreadful scene of the towering inferno with extremes of sadness and anguish. Police were busy controlling the crowd. Amidst all this, people were stunned when they suddenly saw a temple priest emerging out of the ground floor of the building with a boy clinging to his arms. It was a heroic rescue in which the temple priest had risked his own life to save the life of the boy.

Thrilled to see their son alive and after taking control of him, the parents thanked the priest profusely for saving the life of their son, and the following conversation followed:

Priest: Please do not thank me; I have only done my duty. Thank your stars that your son has got a new lease of life. Now he has the whole life in front of him. Teach him to prove to the rest of the world that his life was worth saving!

Fire Officer: We salute you for what you have achieved, which we could not. Sir, who motivated you to risk your own life to save the boy?

Priest: I do not wait for motivation or reward. I believe in doing small nameless acts, and just keep going.

Fire Officer: You look like a Nigerian. Are you in any way

connected with the Rotary Club of Nigeria? I once happen to hear Bruce Onobrakpeya, the President of the Club in 2006 and was impressed when he said, "Service beyond self must be viewed in terms of paying our tribute to the people, who regardless of their stations in life, have through their deeds, clearly demonstrated actions, which oftentimes have been called leadership. They go over and above their regular call of duty, by placing themselves in the line of fire, at the risk of personal loss of fortune, reputation, incarceration etc. and even loss of life in very extreme circumstances. They abound in our midst, and are those who are seen standing tall and even leaning forward on the principles, which impact society positively. These servants have no thoughts whatsoever about personal gain, grandeur or deification. They tower above very many people of their generation as beacons of light, towering above turbulence, and showing the way to safe harbours."

Priest: No, I'm a humble and ordinary Nigerian American. Once, I myself was badly caught in a major fire in a Church, virtually without any chance of survival.I am speaking to you today because of the daring rescue of the kind only the New York Fire Service can do. The fireman who saved me, risked his own life. He told me that there was no question of his coming out of the fire without rescuing me and that if they had sent him to hell, he would still rescue me!

Look, gentlemen, I have learnt my lesson from such guys!

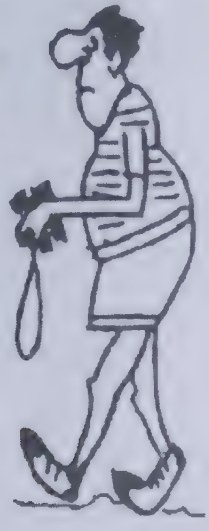
24

CHEER UP, THE WORST IS YET TO COME!

Qutb Minar, India's leaning tower, is a major tourist attraction, especially for first timers visiting New Delhi. It was built in red sandstone and marble, as a memorial of victory by Qutb-ud-Din Aibak, in the year 1199 and has a height of 72.5m with a diameter of 14.32m at its base. Qutb-ud-Din could complete only the first storey of the Minar and the remaining three stories were later added by his son-in-law and successor, Iltutmish. Sultan Feroze Shah Tughlaq finally made it to the fifth storey. The Minar faces threats due to hazards such as earthquake, lightning and stampede. New Delhi falls in the second highest seismic zone of India and the Archeological Survey of India is responsible for the safety of the Minar against all kinds of hazards. The Minar was hit by lightning in 1368 AD and by stampede tragedy in 1981. Its foundations have been strengthened and its rusted iron, stone- interlocking dowels have been replaced by rust-free dowels.

The Minar hit the news headlines when on 5th December 1981 at noon time, a tragedy occurred due to a stampede. There were between 300-400 visitors inside the Qutb Minar of which nearly forty-five were school children. According to an eyewitness, the narrow staircase abruptly plunged into darkness resulting in instant panic. The panic triggered the rumour that the already leaning Qutb Minar was about to fall. Within seconds, this rumour spread like

Qutb Minar, the leaning tower of India, was hit by lightning in historic times, and was also in news for a tragedy due to a stampede in recent years. Repeated threats of earthquakes and lightning could be worse.



wild fire, creating widespread commotion. The commotion led to stampede and chaos. This ghastly tragedy, not only killed many children, but also closed the doors of the Minar to future generations. No visitors are permitted to climb the Minar these days.

Guides conducting tourists occasionally make the story of the above stampede tragedy look even more horrifying. On one occasion a tourist who frequently visits Qutb Minar with his guests saw the same guide again, making the stampede story even more horrifying. To deliberately irritate such a guide, after hearing the heightened version of the story of the stampede tragedy from the guide, the tourist quipped that he had seen much greater tragedies, and this too could have been worse.

What could be worse than this, inquired the Guide?

Tourist: The death toll could have been much higher, after all there were more than 300 persons inside. But that aside, much more could have happened.

Guide: Tell me what more could have happened?

Tourist: The Minar which is already tilting on the southwestern side by about one meter could have actually fallen as was rumoured and killed more people watching it from the outside. But even that would have been nowhere near the worst case scenario, I can visualise.

Guide: Would you please shut up, what could be worse?

Tourist: I have come here many times and I always find you here. You too could have been among those killed. Let me say no more because you lack capacity to accept the truth.

Guide: Sir, are you not ashamed to say so when my wife is right here with me and many of the affected families are even today mourning the dead?

Tourist: Oh, that is indeed saddening and I feel as much pain as you do but the fact remains that it could have been really worse.

Guide: Look, it is a bit too much and I will take your nonsense no more. Have you lost all your senses? How on earth can anybody imagine anything worse than this?"

Tourist: I too could have been amongst those dead!

The moral of the story is that there is always much more than what we can see and there is no reason to get irritated and turn a blind eye to the possibilities, if someone points them out. Never forget, "The worst wounds, the deadliest of them, aren't the ones people see on the outside. They're the ones that make us bleed internally."[1]

In so far as developing disaster scenarios across the globe are concerned, for sure, the worst is still to come. The pessimists among us would side with Daniel Finkelstein, who tells us, "Wipe off that smile, the worst is yet to come." I would like to side with Barbara Johnson for optimism, and say "Cheer up, the worst is yet to come!"

1 Sherrilyn Kenyon, *Infamous.*

25

NEVER GIVE-UP

Like millions of other children in this world, in my childhood, I was lucky to be placed in a large and loving joint family centered around my mother who had exceptional qualities of head and heart. I spent my childhood at home and school in the company of dozens of children of all age groups. While at home we were greatly inspired by my mother and got attracted by my father and uncles who loved children and tried to cheer them by telling stories and distributing dry fruits and sweets. Most of the stories we heard were from the Panchtantra, and by hindsight, I have no hesitation in admitting that without these stories, my life would have been dry, colourless and incomplete. Of the many things I learned from those stories, the moral of several stories was Never Give-up in life. The message is profound, both for disaster managers and the victims of disasters alike.

When a crisis hits and all doors appear to shut one after the other; by never giving up one will always find the last key that opens the door. Every crisis offers limitless opportunities for us to learn and it is only by going through the experience of losing small battles that we can win a war. In fact, it is only when disasters and destinies clash with each other that scripts of the stories of the best and the worst in human response get written. The very shock of a disaster is often enough to rattle the weak and the unprepared, but it is also true that those with prepared minds, grit and

determination generally wriggle out of even impossible situations, unscathed.

While in Roorkee, serving the Central Building Research Institute, Providence gave me the opportunity to meet the first Indian woman climber Bachendri Pal and listen from her own mouth the story of how she conquered Mount Everest. After persistent hard work and rigorous training, she qualified for the reserve team for the Everest expedition. During the expedition, a massive snow avalanche hit the team and most of the ace mountaineers got buried under heaps of snow. Naturally the whole expedition was thrown into utter chaos. Bachendri Pal herself was in a tent which too got buried.

One of her fellow climbers somehow managed to come out of the tent, and cut a slit in it using his Swiss knife. He rescued Bachendri Pal who came out of the tent unhurt, shaking off the snow from her body.

Since many of the ace mountaineers got injured and were in no position to continue with the expedition, the Everest expedition team had to be reconstituted. This incident opened the door of opportunity for Bachendri Pal who had earlier failed to get included in the main team. At that time when many mountaineers backed out, she refused to give up. Rather, she thought that if God was unkind, she would not have survived in the first place. In this way, she got last minute chance to join the new expedition team. The fact that she never gave up and that the avalanche and destiny together did put her on the top of Everest is now a part of human history.

The dare devil adventure of the conquering of Mexico in 1519 is even more captivating. It is the story of Herman Cortes, a Cuban by nationality, who set out to sail from Cuba with 11 ships and 500 men with a mission to conquer Mexico. Cortes was a man of daunting courage and firm conviction. He began the expedition to conquer Mexico in defiance of

the order not to do so. As soon as he arrived on the Yucatan peninsula, he claimed it for Spain. As expected, the natives responded with stiff resistance to his march inland. Deterred by mounting resistance, some of his own men revolted and began to question his wisdom of throwing everybody into the death trap. Many of them wanted him to at once pull back and return without wasting a single minute.

The mounting resistance boosted the resolve of Herman Cortes because he was made of an altogether different timber. In defiance of the simmering discontent, he scuttled his own ships. By doing so, he closed all the options for his men to pull back, flee and return. His message to all his men delivered loud and clear, without speaking a word, was that either they fight to the finish like a lion or they get killed like rats and ants.

History is witness that Mexico was conquered only because Cortes never gave-up.

26

SURVIVING BY THE SKIN OF TEETH

According to Buddha our existence in this world is, "as transient as autumn clouds," and "A lifetime is like a flash of lightning in the sky, rushing by like a torrent down a steep mountain." And according to Geeta, the Holy Book of the Hindus, "For one who has taken birth, death is certain and for one who is dead, birth is certain; therefore you ought not to lament for an inevitable situation." However, is it not a fact that when we see danger, we fear death and when we fear death, we fear the inevitable?

Life and danger are inseparable throughout our sojourn on this earth, and we have two options to choose from. Either we opt to live perpetually under the shadow of danger, or we give a tough fight and browbeat the danger. William Shakespeare had said, "A coward dies a thousand times before his death, but the valiant never taste of death but once. It seems to me most strange that men should fear, seeing that death, a necessary end, will come when it will come."

There is no easy answer to the question why most people continue to fear anticipated dangers and do nothing, rather than prepare and face them squarely with fortitude and courage? The award winning reply to this question comes from Helen Keller: "Security is mostly a superstition. It does not exist in nature, nor do the children of men as a whole experience it. Avoiding danger is no safer in the long run than outright exposure. Life is either a daring adventure, or nothing."

We need to get fired and inspired by countless examples of heroes who survived by the skin of teeth and came out from the jaws of death simply because, rather than fearing death, they faced it with tranquil countenance. Looking at the profiles of some such heroes, the Duke of Wellington once remarked, "I do not know how they will impress the enemy, but by God, they frighten me!" Elanor Roosevelt, a US diplomat and Reformer (1884-1962) once said, "You gain strength, courage and confidence in which you really stop to look fear in the face. You must do the thing you think you cannot do."

Dougal Robertson was one such hero. In the Pacific Ocean, on 15th June 1972 at about 10 a.m., his ship was attacked by killer whales. The attack was so fierce that the ship sank in about 2 minutes. Upon sinking of the ship, Robertson and the five people accompanying him got into an inflatable rubber raft, with a 9 foot fiberglass dingy to row it. The five people were his wife, his son of 18, twin boys of 12, and a student friend. What happened thereafter is described below by Dougal Robertson himself in his book 'Survive the Savage Sea'.[1]

"They were engaged in a fierce and unrelenting struggle for survival. Equipped with emergency rations of food and water only for three days, a handful of random items salvaged from the ship, and no maps, compass, or instruments of any kind, they decided to make for the coast of Costa Rica, 1000 miles and an estimated 50 days away. Steering by the sun and the stars, they set the course for the Doldrums.

The family suffered a bitter blow on the seventh day, when a ship passed nearby but failed to see their flares, leaving them to face sure death from thirst, starvation, and exhaustion, but they did not die.

On the seventeenth day, their raft sank under them, and

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1 Dougal Robertson (1973) Survive the Savage Sea. Praegar Publishers, New York.

still they did not die. Cramped together in their tiny dinghy with only 6 inches of free board, they clawed a place for themselves in the savage ecology of the ocean. On constant alert against 20 foot waves, marauding sharks, and many other hazards, they endured through rain, storm, calm and equatorial heat. With knowledge as their principal weapon, love as their bond, and courage and self-sacrifice as their way of life, these six people lost in the vast Pacific Ocean, refused to admit defeat. After 37 days, 8 hours, and 40 minutes, the Robertsons' ordeal came to an end when a Japanese fishing boat picked them up, with only 290 miles to go to land."

There is a fascinating story of a great escape from death, as narrated by one of the survivors himself, and documented by Rear Admiral C.P. George in his article "War Memoirs of an Engineer." The survivor told Admiral George that he was not wearing a life jacket when the torpedo struck the ship. In two or three minutes, the ship started to sink and being a good swimmer, he decided to abandon the ship. He managed to float for some time by the side of another officer who was floating with his life jacket on. After a while, he became exhausted by the cold and rough sea and was ready to give-up and get drowned, and say goodbye. At this, the officer with the life jacket asked him to hold on saying that he was not tired because he had the life jacket on. He removed his life jacket and gave it to his friend, asking him to wear it. The two officers planned to wear it alternately, whenever the one floating without life jacket got tired. However, a life raft came their way soon after and both were saved."

In contrast, there are scores of people who die many times before their death. In one such story, Raghav, a local temple priest, alerted King Rana that his end was only ten days away. As the fateful day drew nearer, the King became restless and spent all his time praying for longevity. Pleased with his prayers, Yama, the lord of death, appeared two days before his death and asked the King to fully enjoy the last

The King who travelled thousands of kilometers and did everything possible to dodge death, was killed by snake bite upon arrival in Haiti.

two days of his life. Yama added that he would return after a couple of days to pick him finally. While departing, Yama expressed his surprise to find the King in the temple.

The King, having heard of the alert from the horse's mouth, thought of a plan to dodge Yama. He rushed straight to the airport and took the longest possible flight to the farthest possible destination, namely, Haiti. As his plane touched the runway in Haiti, there was a big earthquake. The plane crash landed and caught fire and killed all the passengers, other than a physically challenged person and the King. The King was jubilant when he walked out unscathed. Within two minutes, while he turned to look back at the plane wreckage, he died of a snake bite.

Is there any escape from death at all?

Yes, you can escape and survive by the skin of the teeth, just be fearless.

27

WE ARE OUR CHILDREN'S ROLE MODELS

My family and I passed through the anxiety and ordeal of two major hurricanes, namely, Irene and Sandy in Manhattan in New York in two consecutive years 2011 and 2012. We lived on the twenty-second floor of the River Gate Apartments overlooking the East River. The first hurricane, Irene, we faced was of category 3, with the highest wind speed approaching 195 km/hour and in theory, wind speeds exceeding 120 km/hour are generally regarded as destructive. We saw through it a Bollywood thriller spread over the period 20th August to 28th August, 2011. The death toll slowly started building up and the count finally reached 56 people dead. The very next year we faced Hurricane Sandy which was deadlier although the maximum wind speed was lesser, peaking at 185 m/hour. Sandy took a toll of 285 lives and the devastation it caused was chiefly during the period 22-31 October 2012.

On both the above occasions, River Gate Apartments, where we lived, were placed in the highest danger zone. There were frequent and fine-tuned, location-specific forecasts and alerts as the hurricanes developed, climaxing in the call for evacuation to a safer location on both the occasions. Almost all members of my family were willing to move and some even appeared keen to quickly respond to the evacuation calls. They knew well that hurricanes create severe winds, devastating floods and violent storm surges. They had also heard about the power of hurricanes to blow away house

tops by tens of meters. I stepped in to discourage the idea of evacuation both times, because personally to me these were rare opportunities to see and feel the hurricanes and learn from them outside the classroom. I quickly mapped the worst case scenario to convince every one at home that the risks were manageable and stakes were not high. Placed on the twenty-second floor we had no fear of rising wave heights in the East River and flooding of the lower floors. There was enough preparation time to take care of other threats.

Respecting my seniority and relatively superior knowledge of what hurricanes may mean to safety in the situation we were placed in, my family agreed to join me in defying the evacuation call. On both the occasions, together, we did everything possible to prepare ourselves to face the hurricanes. Stocking of enough food, drinks, water, medicines, torches, batteries, and tapes received our immediate attention. We then prepared our *Go bags*, secured and reinforced our window and door openings by broad and strong tapes, and kept a close and continuous watch on the huge wind currents heading towards eastern United States, which made our glass windows repeatedly shiver and rattle.

We somehow survived our defiance of the evacuation call during Hurricane Irene without much of a problem or inconvenience. But the increasing fury of Hurricane Sandy broke our confidence in the strength of the windows and doors, and we were forced to vacate our bedrooms and retract to the safest part of the long corridor in the lift block outside our flat, where we passed the night. We were aware of the fact that damaging wind and rain could arrive even before the eye of the hurricane passed over the River Gate Apartments. It was hard for us to say when the ordeal would be over because we knew well that hurricanes were self-fuelling storms. If starved, they could die out in a day. When well fed, they could survive for two to three weeks depending on the oceanic conditions along their tracks. As

expected, rattling of the windows was at its worst as the eye of the cyclone crossed over our building.

Slowly but surely, Hurricane Sandy began to hurt. The whole of the Rivergate building was without electricity as the powerline was shut off. No heating or cooking was possible. The food stored in refrigerators also gradually began to turn stale and had to be thrown away for fear of an epidemic, as ordered by the Mayor of New York. Worst of all, without running water, it became impossible to continue living without heating and with stinking toilets. Eventually, there was no option for us other than to evacuate the building facing problems typical of delayed evacuation. We could return to the building only after facing the ordeal of about one week or so.

After going through the ordeal of Hurricane Sandy and upon introspection, I came out with mixed feelings. I was happy to have felt the bizarre dance of the two hurricanes, especially Sandy, firsthand. I had learned as a student of Physics that the force of wind can be appreciated only as the square of the speed. This was the occasion when I felt how the wind force increased as speed picked up.[1]

What the Mayor of New York and his team did to fight Hurricane Sandy was a contrast from managing Hurricane Katrina. It had profound lessons for the rest of the world. Alerts were perfect. Quality and timeliness of response from the Police, Hospitals and Fire Stations was deeply comforting. Communication between the managers and those affected never broke down. Coordination between the teams was so good that evacuation operations could be carried out in the face of fierce winds with surgical precision. Every possible attempt was made to clear major traffic routes. The various

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1 "The force of wind follows a simple mathematical formula: force equals velocity squared. A 300 mile-per-hour wind was not three times as powerful as a 100 mile-per-hour wind; it was nine times more powerful." Quoted from Nancy Mathis: Storm Warning—the Story of a killer Tornado, published by Simon and Schuster, p. 134.

operations were planned to such detail that even door to door collection of stale food was done well in time to avert breaking out of epidemics and people were able to easily recharge their cell phones. Everything looked as if it was on an auto-pilot. All this could not have been possible without the selfless service of the dozens of unsung heroes and experts in their respective fields, working with the sole aim to save lives and serve people!

On the whole, by hindsight, the experience was also transformational for me. I clearly saw with regret a total disconnect between my preaching and practice of the rules of safety. In my lectures and seminars, I had always impressed upon my audience to religiously respect evacuation calls, which in this case, I myself flouted, for whatever reason. Little did I realise that we are our children's role models and it is pointless to preach what we cannot ourselves practice. Parents teach children not to cross the road when the traffic light is red, but they themselves do so even when crossing the road with the very same children they preach. On the roads of New York, I frequently see parents with small children crossing the road in defiance of the red light just because there is no traffic at the time of crossing the road. Children will make a careful note of all this and will surely copy the same in the future, distancing our societies from the cherished goal of nurturing the culture of safety.

We also often see educated people driving cars without seat belts and motorbikes without helmets. You can guess what their children would do. While at the picnic, they loiter around in open gardens with their families, disregarding the possible strike of lightning during bad weather. Is it not extra-ordinary to see that the buildings in which engineers and architects live sometimes collapse, whereas they are expected by society to set examples of safe construction. We knowingly or unknowingly keep setting bad examples and still harbour hopes that our children will do the right thing. The lapse on

our part could be quite serious as we face unprecedented threats of human violence and civil war. If we take to guns to destroy others, for sure, we have to be prepared to suffer violence ourselves. Abraham Lincoln once said, "Let not him who is homeless pull down the house of another, but let him work diligently and build one for himself, thus by example, assuring that his own shall be safe from violence when built." Mahatma Gandhi became a role model for the whole of mankind because he always walked the talk and told us, "We have to be the change we want to see in others." For bringing about change, we need agents of change; we need role models.

While introspecting on my double speak with regret, I was reminded of three of my role models, namely Captain Mahendra Nath Mulla for sticking to high ideals; Dr Iswar Chandra Vidyasagar for humility, simple living and high thinking and George Washington for exemplary leadership.

India and Pakistan went to war on 4th December 1971. During the course of the war, on 9th December at 20:50 hours, a Pakistani submarine torpedoed INS Khukri, a frigate of the Indian Navy. It sank 40 nautical miles off the coast of Diu in which 18 naval officers and 176 sailors perished. Captain Mahendra Nath Mulla was in command. Commander Manu Sharma, one of the six surviving officers, narrated the following Story to Rahul Tripathi, a reporter:

"INS Khukri sank within minutes and there was hardly any time for us to think about the survival. Every single minute was crucial and when you are in the middle of such a situation, your mind stops thinking. All one could think about is how to rescue more and more and more people... I remember when the ship was sinking after being hit by Pakistani submarine PNS Hangor, there was a small hatch escape from where we were pulling the sailors and everyone was trying to save his life. My Captain M.N. Mulla pushed me and Lieutenant Kundan Mall from the ship and said you

go ahead, do not worry about me. When Kundan Mall and I started swimming under water, after a while I lost track of Kundan Mall. And as I looked around for him I saw Captain Mulla holding the top of the ship's railing with a cigar in his mouth. Those were the last minutes for INS Khukri and Captain Mulla, who chose not to abandon the ship." Indeed "Captains don't abandon their ships".

Captain of Khukri, Capt Mahendra Nath Mulla saved several lives, but he refused to leave the ship. His daughter Ameeta Mulla Watal while releasing the book titled 'Sinking of INS Khukri—Survivors' Stories' (Roli Books) authored by Maj Gen (retd) Ian Cardozo said, "One such man is enough to bring honour to an entire nation for a life time."

Ishwar ChandraVidyasagar provides one of the best examples of humility and simple living. He was a great philosopher and educator, who by his conduct earned the title of *Vidyasagar*, a Sanskrit word meaning *ocean of knowledge*. Nearly two centuries ago, he was born in a remote village of the Paschim Midnapore district of present day West Bengal in India. Wherever Vidyasagar went, his deeds spoke louder than his words. People came from long distances to listen to his lectures. On one occasion when he was travelling in a train, he could not even be identified by a number of people who were travelling in the same compartment to attend his lecture. When the train stopped, everybody got down.

A young man who had come to the town to listen to Vidyasagar had only a small suitcase as baggage and yet he was frantically looking for a porter who could carry for him that suitcase to the taxi stand. Within seconds, instead of a porter, one of the co-passengers approached him, offered to help and took his suitcase to the taxi stand.

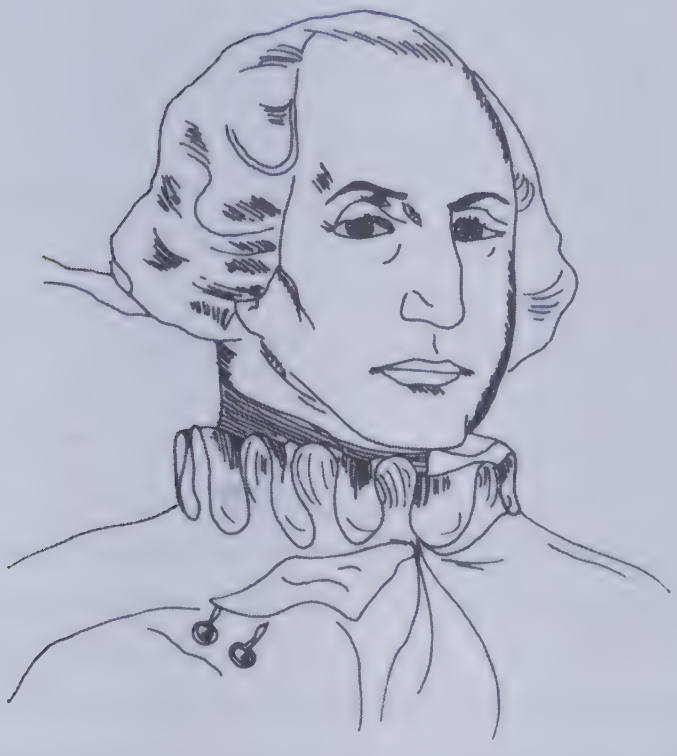
The young man reached his hotel, freshened up and arrived at the venue of the lecture. His heart sank into his boots when he saw that his *porter* at the railway station was

none other than the distinguished speaker of the day—Ishwar Chandra Vidyasagar.

Mankind needs a constant supply of such role models. We can also contribute by being our children's role models.

Einstein once said,"Setting an example is not the main means of influencing others, it is the only means."

Iswar Chandra Vidyasagar helping out a co-passenger who was frantically looking for a porter.



George Washington
1731-1799

George Washington, my third role model for leadership, was the first President of United States of America, more than two and a quarter centuries ago. Very few people may know that he was also the Commander-in-Chief of the Continental Army during the American Revolutionary War. Once when riding a horse, he saw some soldiers who were struggling to lift a heavy log of wood without much success. The corporal who led the team of soldiers did not lift even his little finger to help them. When George Washington saw this, he got amused and asked the corporal why he wasn't helping the soldiers? The corporal replied: "I am the corporal. I give orders." No sooner did he hear the reply that he himself got down from his horse, folded his sleeves and went straight to join the soldiers and helped them lift the log. After the task was accomplished, the General mounted the horse, went to the corporal, who had so far failed to recognise him, and said, "The next time your men need help, send for the Commander-in-Chief."

28

INHERITANCE OF LOSS

Teacher: Girls and Boys. How many of you have read the novel 'Inheritance of Loss' by Kiran Desai, a noted Indian author?

Ishita: Sir, I saw it because my mother bought the book the day it was released. I even remember two of its famous quotes, namely, "The present changes the past, looking back you do not find what you have left behind", and, "Could fulfillment ever be felt as deeply as loss?"[1]

Teacher: I'm glad you mentioned these two quotes which I was myself going to do this morning. In our lives, whenever we look back, we no longer find many things which our forefathers had left behind. They are certainly a loss, but who keeps a record of what we had been losing for centuries? Many things our forefathers have left behind still exist, but are hopelessly out of shape. That too add to the litany of compounding losses, but again, since no transparent and systematic monitoring systems are in place, a true picture of the inherited losses will continue to elude us. It is also true that many things that did not exist before, are being added, now and then and here and there. It is a natural question therefore to ask what difference have these things made to alleviate the pain of loss? And finally, do we have a blueprint of action and best practice examples with which we can hand over the planet back to our children, in good shape?

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1 Kiran Desai, *The Inheritance of Loss*.

Ria: This is not happening, perhaps because those affected are seldom fully out of the trauma and heat of losses and those spared or untouched seem either unimpressed or unconcerned. I guess not enough has been probed, spoken and written about lost information and heritage in the context of disasters.

Teacher: The list of losses is very long. The world will never be the same again. When the Great Hurricane of 1938 struck the United States of America, the Associated Press wrote: "The greens and commons of New England will never be the same. Picture postcard mementos of the oldest parts of the United States are gone with the wind and flood. A great part of the most picturesque America, as old as the pilgrims, have gone beyond recall and replacement." The story is more or less similar, regardless of the point on the globe one stands on.

Ishita: My father told me that Dwarka where Lord Krishna was born is now under water and the history of Mohenjo-daro and Harappa periods give us the pain of permanent loss. In the Uttarakhand State of India, I myself went on a pilgrimage and was told that many of the temples which existed for centuries no longer exist.

Teacher: What is worse, we do not even have scientific documentation of the heritage lost. Until the last few decades, even the power of photography and videography from land, sea and space was not fully tapped which is why the present generation hardly knows about the rich heritage other than reported in the books of history.

You have asked about the loss of heritage in Uttarakhand, often ravaged by earthquakes, landslides and floods. Let me cite an example. There was a devastating earthquake on 1 September 1803 at seven minutes past three in the afternoon, which played havoc with the cultural heritage. And we would have never known so much about the damage it did, but for the Rapper F.V's narrative of a survey for the purpose

of discovering the source of the Ganges and some of the ruins which continue to give us a glimpse of what we had lost.[2] But for documentation in the Asiatic Researcher, very few people of the present generation would know what had happened to the temples of Devprayag and Badrinath in the very same earthquake.[3] "The temple of Devprayag has been repaired after the 1803 earthquake...as also that of Badrinath.

Rama: Egypt, like India, also has a rich cultural heritage. How did they fare?

Teacher: Egypt had a rich tradition of constructing temples and monuments in honour of Egyptian Gods, especially close to the river bank. I see an identical example, in the ancient Abu Simbel temples of Egypt, the colossus of which collapsed in an earthquake and was lost forever when the temple was physically moved to a different location during construction of the Aswan Dam. As per historical records, by neglect, the temple got covered by sand so much so that by sixth century BC, sand even covered the statues of the main temple up to the knees and remained forgotten until 1813.

Ishita: An ancient temple was physically moved to another location-why?

Teacher: Aswan Dam, as some of you would know, was built in 1971 as the highest rockfill dam of its kind on the world's longest river Nile which is about 4100 miles long. River Nile was known for devastating floods, especially those of 1964, 1973 and 1999. The floods frequently destroyed agriculture crops and were a threat to Egypt's cultural heritage. During dry weather spells, Egypt faced drought and famine. The dam was conceived as the answer to flood, drought and famine as also to meet water and energy

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2 Rapper F. V. Narrative of Survey of the Purpose of Discovering the source of the Ganges. Asiatic Researcher, V. 11, Pt. X pp 511-512 (Courtesy: Alexander Strom-Personal Communication).

3 Asiatic Researcher, Ibid, p. 491.

demands. Some of the temples came under the shadow of Lake Nasser created by the Aswan Dam and therefore the choice was clear-either lose them or relocate them. Posterity will always thank them for going by the second option.

Ishita: What has happened to those temples and monuments? Did they get submerged?

Teacher: The problem of submergence was anticipated in advance and everything possible was done to save as many temples as possible. The whole world knows that about 22 monuments and the Abu Simbel temples on the western bank were relocated to the shores of Lake Nasser. Today, thousands of tourists throng the temples daily.

Ria: Well done Egypt, but how did they relocate the famous Abu Simbel temples?

Teacher: The task of relocating the Abu Simbel temples was taken in hand in 1964. It took about four years to cut the entire site where they were originally located in large blocks, weighing between 20 and 30 tons. These blocks were then lifted and reassembled 200m away from the river bank, raised to an elevation, 65m higher than the river level. Posterity will find a sense of fulfillment in the unusual relocation initiative, despite the huge expenditure involved.

Ishita: What losses did the Egyptians inherit in all this?

Teacher: Losses are incalculable. For example, there is no way to quantify the plight of the orphaned 100,000 Nubian displaced people from their homeland. The loss of soil fertility, increase of soil salinity, rising water table, diminishing fish population, loss of cultural heritage, and submergence of antiquities and relics under Lake Nasser all add to the inheritance of loss.

Ishita: Sir, what have you to say on the joy of accomplishment in this context?

Teacher: There were no Abu Simbel temples in the times of those who were born before 1264 BC in Egypt. If they were to visit us again, they would be happy to find the Great Abu

Simbel temples which did not exist in their times. But if those who were born after 1244 BC were to visit us, they would be sorry not to see the Abu Simbel temples where they had built and left them. And future generations will hardly know whether the temples had to be shifted in 1967 to facilitate the dam construction.

Amol: Nothing much can be done about what is already lost. What is more important is to ensure that we do not add to the losses, and try to reduce the pain of loss by our own conduct and effort.

Teacher: We have discussed only a miniscule part of the problem. Our planet is bleeding as a whole. It is wounded in the clash of civilisations, fight between nations and societies, industrial boom, mindless urbanisation, plundering of the environment and natural disasters.

Ishita: It is true, but we also have a sense of fulfillment because of the mind boggling advances in Science and Technology.

Teacher: Yes. According to C. P. Snow, "Technology is a queer thing. It brings you gifts with one hand, and stabs you in the back with the other." It is important to find out what does the balance sheet look like? Which one weighs heavier — the joy of fulfillment or the pain of loss?

I am glad to announce that our class will soon have a tour of the Three Gorges Dam in China to study a case record of the power of technology and what it may mean to mankind. The Chinese have built the dam so big that one day you may get a chance of seeing it from the moon. We will continue with our discussion on how posterity will view this contribution of the Chinese.

Meena: Where is the Dam located and how can it be reached?

Teacher: It is located near the Sandouping Town in Yichang City in Hubei Province. We will go to Yichang City, take a bus and get off at Yemingzhu Station. Then we will take

bus no.8 in the dam area and get off at the Liuzhashou Tourist Reception Center, and take a minibus to visit the dam area.

Students were very excited about the study tour and they could not believe that they were already on the Three Gorges Dam.

Teacher: This is the mighty Three Gorges Dam, which we have come all the way to see. It is the biggest hydropower plant ever built. Look at the mighty Yangtze River, the third longest in the world with a length of 6000km, two and a half times the length of river Ganga. Its total generating capacity is a whopping 18,200MW. The dam is 610 feet high and 1.3 miles long.

Ishita: Indeed, it appears to be a marvel in engineering and a dare devil job done by the Chinese, without parallel anywhere in the world. Did it provide the Chinese a sense of joy and fulfillment and do they consider it as their contribution to posterity? Sir, I am told small is beautiful, then why they had to make it so big?

Teacher: China is a big country that supports the largest population in the world with huge energy needs which is why it had to be so big. The dam is designed to increase the national energy output by as much as 10%. Also, it has increased the shipping capacity of the Yangtze River. Is it not amazing that huge ocean going freighters can now sail right into the heart of China? The dam is also expected to reduce flood disasters on the downstream side, bringing relief to nearly 200 million people. Moreover, imagine the jobs and livelihood it must have provided to the population for decades.

Ishita: Do they find a sense of fulfillment in it and what are their regrets? Is it not strange that many people across the globe call it an ecological disaster? If what the protestors think is not true, then why are they anti-development?

Teacher: Good and bad, advantages and disadvantages, benefits and losses, joy and sorrow, pleasure and pain, etc.

are pairs of opposites which often go together. The major difficulty is however the way we quantify the degree of fulfillment. How much of our quantification is subjective, and how much of it is objective. Environmentalists know that this location is the home of about 6,388 species of plants, which belong to 238 families and 1508 genera. Of these plant species, 57 percent are endangered. They fear that the Three Gorges Reservoir will inundate 632 sq. km of area causing submergence of 13 cities, 140 towns, 1300 villages, 1600 factories and nearly 1000 archaeological sites. The scenario will be much worse if we add the potential threat of submergence of nearly a quarter of the nation's farmland, not to speak of the loss of biodiversity.

Ishita: Clearly I too feel the heat of the loss. I heard you say that the dam is built on a geological fault-plane. What would happen to the safety of the dam in the event of an earthquake? An earthquake may generate landslides which in turn can raise reservoir water levels, threatening dam failure. Are the Chinese prepared to face possible dam failure?

Teacher: The very idea of dam failure is dreadful. Imagine what will happen to millions of those who will get affected. Let us believe that the Chinese have a plan up their sleeves. Let us wish them well.

Ishita: Do we have a safety plan for the Tehri dam? What happens if it fails?

Teacher: Only time will tell. Let us hope that the government is seized of the challenge and experts will use the best in science and technology to rule out failures in every form.

Girls and Boys, Always remember that we have not inherited this planet from our forefathers, we have borrowed it from our children!

29

DISASTERS ARE NOT ALL THAT BAD

At a world conference on disasters, an expert laboured hard to prove that Disasters are not all that bad. Citing examples after examples, he particularly recalled the years 1665-1666, which were very bad for England because of the heart rending plague, and the great fire of September 1966 in London, and yet the events were good for the rest of the world.

One night, a baker's shop in Pudding Lane caught fire which then swept through the narrow streets of London driven by the strong currents of wind. The fire could not be brought under control for four full days. In the meantime, it fanned out over 500 acres of the area, destroying 87 churches and 13200 houses. Nine lives were lost. All this happened when the people were already in the grip of famine.

A delegate: How on earth, disasters like the deadly fire and the debilitating famine of this scale you mention, can ever be of any advantage?

Expert: Hold on my friend. By hindsight, the years of famine are recognised as a glorious period in the history of science. It was in 1666, exactly the year of the plague, that Sir Isaac Newton (1642-1727) made his path breaking discovery of the law of gravitation. He observed the falling apple in his garden at Woolsthrope, his birthplace, where he camped during the plague period 1665-66, when the university remained closed. It was at that time that he also began to think of gravity extending to the orbit of the moon.

In Newton's own words: "All this was in the two plague years of 1965-66, for those days I was in my prime age for invention, and minded mathematics and philosophy more than at any time since."

The delegate: Okay, you have a point of view, but what good did the great fire do?

Expert: Recovery from plague at that time looked almost impossible without intervention and respite by the great fire. It countered the very conditions which bred the plague.

Delegate: Are there any examples of the beneficial effect of other types of disasters?

Expert: It will be wrong if I say that dust storms and heat waves are welcome.Take for example the State of Rajasthan, the hottest of all in India as if to constantly remind people that it is here that the Thar Desert is located. Sangeeta Sharma wrote on 4th June 2003 for Agence France-Presse, "Water has vanished from 7964 villages and 460 000 hectares of crops have already perished…the scorcher has killed nearly 1200 people nationwide since May end." This was serious.

Similarly, we all hate dust storms and thunderstorms for the damage they do, but they too have beneficial effects. Their occurrences bring down mercury to provide a shower of relief. Heat wave conditions are countered by dust storms resulting in the drop of atmospheric temperature. In many parts of the world dust storms and thunderstorms relieve us of nasty heat waves which may otherwise persist for days and weeks when mercury sears through thermometers. The temperature variations often tend to be highly erratic, often throwing short term meteorological prediction to the winds.

Let me take you to the deadly heat wave of May 2003 in the State of Odisha in India. The capital city of Bhubaneshwar recorded a temperature of 37°C on 26th May but the very next day the mercury hovered over 44.9°C. The temperatures had in fact crossed 46°C in the same month of the years 2002 and 2005. This brought normal life to a grinding halt. Then

came the dust storm to bring down temperature and provide a sigh of relief. Similar was the experience on 10th June 2007 in Sri Ganga Nagar district of Rajasthan in India that recorded a blazing 48.9°C, a reminiscent of what happened on 9th May 1995, when the temperature rose to 49.9°C in Barmer district. Alwar district had also recorded a maximum of 50.6°C. Once again, relief dawned only after dust storms swept the districts.

Delegate: How does Nature handle large scale air pollution?

Expert: The desert winds (known as Santa Ana) which whip up wild fires to destroy suburban homes also clear air pollution out of valley neighbourhoods.

Delegate: And how can floods be of advantage?

Expert: The floods are considered dangerous because they spread hazardous waste across large areas. But the very same floods become beneficial when they wash away hazardous wastes from our lands.

Delegate: You seem to have all answers. Tell us how the most feared and dangerous of natural disasters like, for example, a volcanic eruption can do any good?

Expert: No doubt volcanic eruptions are most feared and dangerous of natural disasters. But they are also the fountainheads of fertile lands skirting the valleys. Volcanic ash is rich in nutrients and every volcanic eruption renews land fertility and attracts agriculture. For instance, more than one million Indonesian people thrive on agriculture at the foot of volcano Merapi alone. Go and ask them if they would like to erase Merapi from the landscape of Mother Earth to get rid of future volcanic eruptions? The answer would be a big NO. The trade off between evacuating people from the threat zone of a volcano and protecting them is often beyond human comprehension. El Misti Volcano of Peru, which erupted last in 1878 and is dormant to date, could not prevent the city of Arequipa from coming up. It would

have perhaps been a bigger problem not to let this happen for fear of re-eruption. Also, Mt. Pelee Volcano erupted in the Island of Martinique on 8th May 1902 with which the city of St. Pierre is associated.

Delegate: Are there other advantages of disasters?

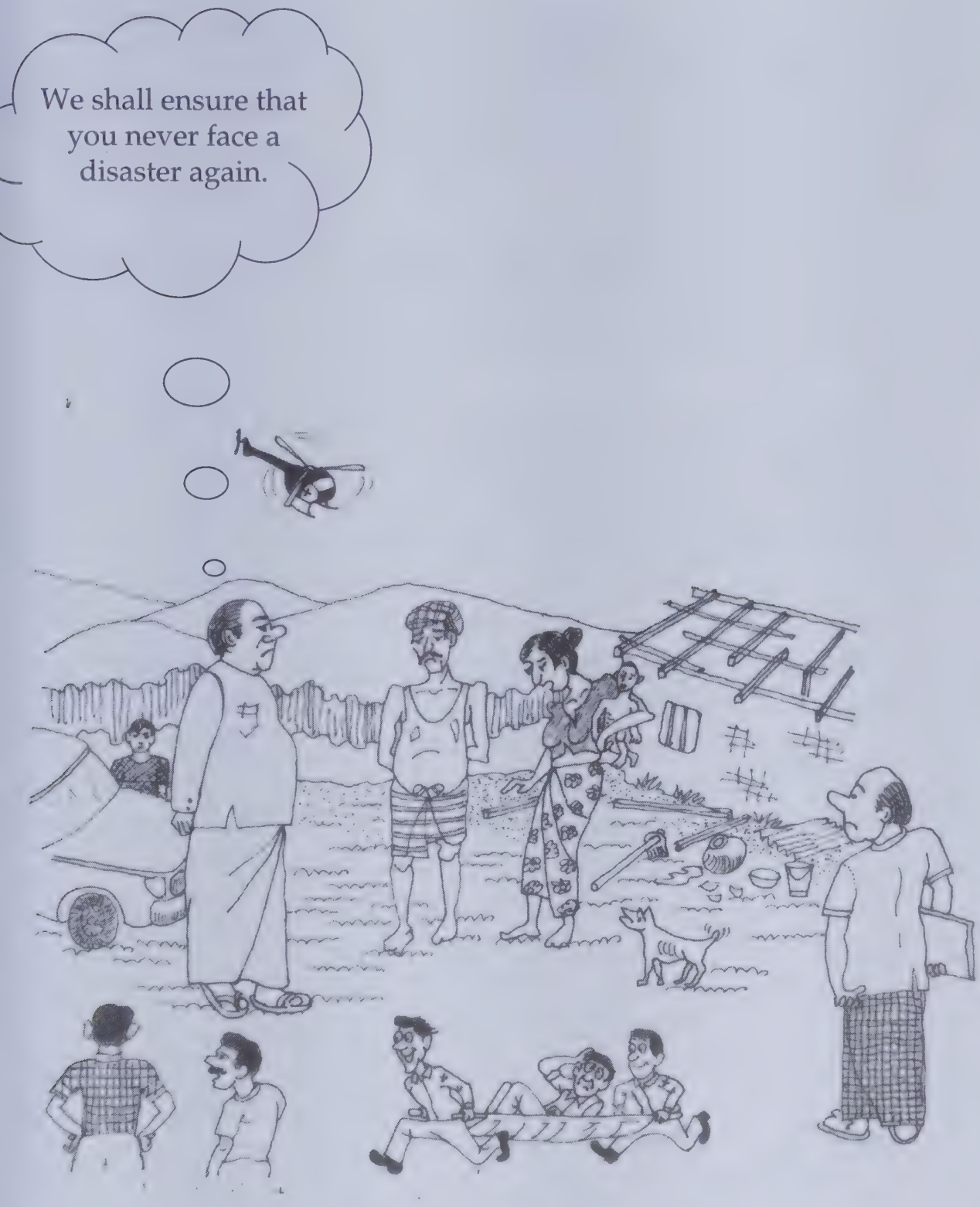
Expert: Every disaster provides policy makers a heaven sent opportunity to put their policies on the anvil. Professionals charged with the responsibility to manage disasters, likewise, get a good share of chance to introspect and see with hindsight where they went wrong, why their preparedness plans misfired and how their strategies let them down so badly? Scientists do get an unexpected load of new problems, and enough food for thought to re-write their research proposals in search of cost effective solutions anchored to ground realities. Since the dead tell no tale, those who survive are the most reliable carriers of messages. Let us give them an ear and try to find out what is their story? If the desire to learn is genuine, disasters will always strengthen the weak, and arm the strong.

Delegate: How could a crisis be good?

Expert: The Chinese word for crisis is made of ideograms for *disaster* and *an opportunity*. Therefore the good news is that every disaster is an opportunity to think out-of-the-box, learn, innovate and emerge stronger. It offers live laboratories of nature to re-analyse and re-evaluate the previous body of knowledge, raise a fresh set of questions, discard baseless assertions and add a few more bricks to the edifice of knowledge.

Expert: Ladies and Gentlemen, now let me ask you about what you think of disasters?

"Disasters are not all that bad after all, if we can convert them into a set of fresh opportunities earned at a heavy price," came the reply from the audience.



In many remote areas where life is a daily struggle for food, water and clothing, natural calamities are perceived as occasions during which villagers are able to attract the attention of the government and receive material and financial support in gratis.

30

TWO MAGIC MANTRAS

Disaster struck a village at a time when it was expected the least. People ran helter-skelter. Hundreds were killed and thousands became homeless. The victims suffered further because relief agencies took quite some time to arrive. Upon arrival, they found a total mismatch between the real felt needs of victims and their capacities to meet those basic needs. They decided to place the victims in four categories as a part of their plan for quick relief distribution.

People who were struggling for survival, needing urgent medical treatment, were placed in Category 1 for highest attention; those who were injured and completely ruined and rendered bankrupt with absolutely no one to look after them were placed in the second category to be sent for treatment and trauma counseling with promise of relocation and jobs. In the third category were those who were ruined and bankrupt but had some relatives to fall back on. Such people became entitled for some monetary compensation. In the last category were those who could be discharged soon after some first-aid and food coupons.

Victims, tense as they were, began to question the very classification and there was nearly a stampede among the victims to jump the queue into the higher categories of attention and care. While many kept screaming in pain and anguish, many more were badly injured because of the stampede.

One Victim: Sir, This gentleman over here was placed in a lower category because he had no injuries at that time. Now the stampede has broken his bones and he is struggling for survival. He should be placed in Category 1.

Second Victim: Sir, I have been placed in Category 4 but my father is in category 1, you should allow me to join him because he critically depends on me for everything.

Third Victim: Sir, this gentleman over here was ruined and bankrupt years before the disaster had occurred, why should he get all the benefits now?

"Hold on ladies and gentleman, we are reaching nowhere," thundered the relief coordinator.

"But what about us here?" A boy cried with a deep pain in his voice. So angry were the people that they pounced on and assaulted the relief coordinator who himself got badly hurt.

Fifth Victim: Now tell me which category you belong to, Sir?

In the melee, the headman of the village arrived. He commanded much respect in the village and was well known for his fair play. People of the village seldom questioned him for anything he did and even for things which he did not do. This was because of his great strength of moral character, compassion and impartiality in decision making. Quick to grasp the situation, he began to console the victims and instantly touched an emotional chord with most of them. While reciting prayers, he broke the much worse news that many of the doctors who had come from outside had also been injured or killed because of the hospital collapse. Even two of the hospital ambulances had been destroyed. Many of their fellow villagers at another location were therefore in much worse conditions and were literally battling for life in makeshift hospitals.

Listening to the highly disturbing news, the victims became calm. He then joined the assistant relief coordinator

in first attending to the people battling for survival, asking everyone needing urgent medical help to group together. The whole scenario was different. The volunteers were soon at work to attend to medical emergencies as best as they could. Relief was distributed without any hiccups. The funeral of the dead was arranged. Special care was taken of the physically challenged, the elderly, the women and children.

The headman kept on his conversation with a healing touch as the relief distribution progressed. He said that all those who were unhurt or even those with minor injuries should join him and taste the joy of serving those in greater pain. He himself had learned this from Bruce Lee, who once said: "Find a place inside where there's joy, and the joy will burn out the pain".[1] To those who were mourning the dead, he said that care more for people in pain than those who are dead. Do realise that when death comes, the pain is over. To those who were suffering in pain, he said that it is their opportunity to be courageous. "The human brain can subjugate anything, even real pain."[2]

He then left after leaving behind his two magic mantras. He asked the victims to cultivate tolerance beyond pain and his mantra for disaster managers was to make preparations and serve victims beyond the disaster plan.

Although disaster managers present at the site found nothing new in the two mantras, it was for the first time that they could relate what they knew with its real meaning in the discharge of their responsibilities. They were eyewitnesses to the extra-ordinary situation resulting from the collapse of fire stations, hospitals and police stations. Their plan could not even imagine that doctors, firemen and the rescue teams could also possibly become victims. There are numerous examples of such things happening. About 200 relief workers got buried under a mudslide in Yingxiu in the Sichuan

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1 Joseph Campbell
2 Bruce Lee

Province of China while rebuilding the road damaged by the massive Sichuan Earthquake on May 12, 2008.[3]

In San Francisco magnitude 8.3 earthquake of 18th April 1906, most of the fire station buildings were destroyed. Nearly 1000 patients and hospital staff got trapped when the city's Benito Juarez Hospital was destroyed by the Great Mexico Earthquake of 1985. And the list is long.

They realised for the first time that the two magic mantras were not for recital but for action.

3 Xinhua News Agency report.

31

THE ALL SEEING EYE FOR THE BLIND

I've myself not seen Alexander Konda's classic film, 'The thief of Baghdad' but I'm impressed by Roger Jone's narration of the amazing magical Ruby, called 'The All Seeing Eye', a kind of crystal ball. The All Seeing Eye once illuminated the forehead of a gorgeous statue of Lord Buddha and was later stolen by the hero of the story, Sabu. The magical Ruby had the power to conjure up and replay, unwind and fast forward any view demanded of it. For instance, one could see at will anyone, anywhere, anytime.

The magical powers of the Ruby dazzled all those who came to know about it. So excited was Tom, a student of science that he stole the Ruby from Sabu's handbag, while he was fast asleep. Excited and amused, Tom rushed to his father, Dick, a professor of disaster management at a local university, to share the news. Although Dick, at first, did not approve of stealing, lured by the power of the Ruby, he too started to dance with joy. The first thing he did was to order the Ruby to replay for him one of the most unbelievable episodes of a disaster anywhere at any time.

Ruby set the clock back in time to 21st October 1638. The place was the church of St Pancras at Widecombe-in-the-Moor on the southeastern flank of Daitmoor in England. It being a Sunday, as many as 300 worshippers had assembled in the Church and were getting ready for afternoon service. As the Vicar George Lydia reached the pulpit to commence

the service, a fierce tornado appeared from nowhere plunging the sky into pitch darkness. Indoors also, everything went so black that people could neither see one another nor could they read their books. The roar of thunder and lightning was frightening.

Suddenly lightning struck the church tower bringing down one of the corner pinnacles. Tom then saw a ball of lightning piercing into the church-window accompanied by a deafening explosion. The ball of lightning swept through the church, spreading smoke, fire and toxic smell all over. The whirlwind gushing indoors, literally sucked some people from the pews, and sent them spinning in the air. Some others were maimed.

Dick was stunned to see a few of them with severe burns on their bodies without any harm to their apparel! He could not believe his eyes when he saw that the lightning ball spared priest George Lydia, but not his wife, who was badly burnt. Roger Hill, a village schoolmaster survived, but his brother by his side got killed. Mater Hill, another worshipper, was punished with instant death, whereas his son sitting next to him was unhurt. Tom saw nearly 62 people getting injured. The cries became louder as 4 people were killed. The ball of lightning disappeared as fast as it came!

Dick, being a teacher himself, knew that hailstorms, lightning and most violent of all, the tornadoes, are atmosphere's most familiar dramatic events. He frequently used to quote Seymour Simon[1] to convey to his students, "Sometimes tornadoes do odd things. A tornado once sucked up a pond full of frogs and rained them down on a nearby town. Another tornado struck a house and carried a five-hundred-pound piano twelve hundred feet through the air."

Dick also thought of Benjamin Franklin, who was the first to demonstrate that rain clouds are electrically charged. He turned to the Ruby and saw how Benjamin Franklin drew

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1 Source: Seymour Simon, In Tornado.

electricity from a rain cloud using a key tied to a kite. He then saw Richman and the whole process by which he proved that the electric charge of the clouds leads to lightning. He was stunned to see Richman getting killed by lightning as though to punish him for revealing the secret.

Tom could not wait any more to enjoy the magic of the Ruby and demanded it from his father, who too was in no mood to part company with it. Dick then told his son that he will ask the Ruby to show in the next ten minutes what all transpired during the last 50000 years? When ordered, Ruby used the logic of Frank Press and Raymond Siever[2] to inform, "If a movie camera snapped the frame of Earth's surface every thousand years, almost 50 million years of geologic time could be condensed to a 35 minute-film. Geological movements that stretch over thousands of years, far too slow to be observed in human lifetime, could be studied and understood. The film would show continents drifting apart to open one ocean and colliding to close another. We could see regions of the earth being uplifted, tilted, faulted, and folded to create plateaus, mountains, rift valleys, and other geologic structures. In other places, subsidence would lower portions of a continent beneath the sea, forming basins in which sediments would accumulate."

To the question, how our vulnerability to different timescales is affected, the Ruby quoted Marq de Villers[3] in reply:

"Our vulnerability to calamity is affected by different time scales on which we and the planet operate. Humankind's entire existence has been a mere nothing in geological time – all the biographies of all homo sapiens are crammed into only a few milliseconds as the cosmos reckons these things.

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2 Source: Understanding Earth, p. 537, published by W.H. Freeman and Company, New York.

3 Marq de Villers: In Dangerous World: Natural Disasters, Manmade Catastrophes, and the Future of Human Survival, Chapter 2, p. 19, published by Penguin Group.

If you look at it positively, the very existence and survival of our species is actually due to that great disparity, the gap between major disasters and the minuscule human life span. So when calamity comes, it has tended to come as a terrible surprise. So very long it has been since the last such calamity that memories have faded, perhaps altogether, perhaps transmuted into legend."

And to the next question, how our planet will look like on the human scale, the Ruby cited the Encyclopedia of Biosphere Ecosystem[4], and replied:

"On a human scale, we see the landscape and the geography of our planet as more or less permanent. We consider rocks to be inert elements about which, from time to time, we receive news of a landslide, an earthquake, or a volcanic eruption. The gradual elevation of a mountain range, the relentless erosion of surfaces, or the widening gap between the shores of an ocean necessarily go unnoticed, simply because they occur at a pace that only geological observation is capable of detecting. The formation of waterways requires tens and even hundreds of years, glaciation thousands, continental drift millions, and formation of the atmosphere, thousands of millions of years."

"All this is heavy stuff. Please look into the Ruby and tell me what would be the future like, Dad?" asked Tom.

"The future is yet to come and it is in our hands, my son. The question should be what we would like to be?" replied his father.

With business as usual, the Ruby clearly demonstrated that the world is becoming increasingly more unsafe with the signature of climate change. We are already being enveloped by rising temperatures, attacked by more intense heat and cold waves, and threatened by exceptional winds, droughts and floods. When the year 1998 was declared as the warmest

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4 Eycyclopedia of the Biosphere Ecosystem, Volume 1, Our Living Plant.

year in the 1200 year history, we were also told that the worst is still to come. Temperatures of the oceans are now on the rise, signaling deadlier hurricanes. The Ruby showed an increase in the typhoon breeding areas. If the greenhouse effect compounds, the global rise of temperature may lead to alarming sea level changes, exposing small island States to submergence and displacing populations.

Tom: Daddy, let us go and see Maldives before the threat materialises!

Dick: We certainly will but let us listen to the Ruby first.

The Ruby showed hard evidence that tropical storms will extend toward the Poles, more water vapour will mean heavier rainfall, more floods and greater number of thunderstorms, and tornadoes. The coastal regions will see far more storm surges, particularly where a rise in sea level and a higher frequency of storms coincide. There will be frequent and serious droughts with the increase of El Niño strikes. Climate change will also give fillip to avalanches, landslides, rockfalls and other mass-movements. Areas deficient in rainfall will face droughts, more frequently and in areas of drought, forest fires will fan the damage. With the rise in temperature and melting of glaciers, there will be more of Glacial Lakes and Glacial Lake Outburst Floods.

Tom: Dad, Just ask the Ruby one thing most profound that we should do to reverse the trend of degradation and revive old glory?

The Ruby replied:

Inculcate the same culture of non-violence against Nature as people find in the thoughts, deeds and teachings of Mahavir and Gandhi. Stop all forms of violence against our eco-system and vow to live in harmony with Nature. If Nature had eyes, you would see tears in them. If Nature had a face, you would see patience on it and, if Nature could tell its tale, you should be sure that it would have the last laugh. Better mend your ways.

And finally, the Ruby quoted Martin Redfern to conclude:

"We are no longer the victims of our planet; we are the custodians of it. Through our inconsiderate greed for land and our disregard for pollution, we bite the hand that feeds us. But we do so at our own peril. We still have all our eggs in one basket, all our people on one planet. We need to care for that planet and take responsibility for it. But we also need to progress with research for new homes and technology to take us to the stars."[5]

Tom was fully transformed. "The Ruby has already given eyes to a blind like me," he told his father.

"Let me now return the Ruby I stole to its legitimate owner and atone my sin of stealing. I have no more time to waste on it because life is short, and there is so much to do!"

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5 Martin Redfern, The Earth, In the Epilogue, p. 132.

Reflections on the Book

In our engineering profession, thought leaders of the quality of Dr. R.K. Bhandari are rare. Rarer still are their creations that innovatively communicate to the society causes and consequences of the great challenges of our times, disasters being among the top few. Dr. Bhandari's captivating book on the subject of disasters is unique not only in terms of what new knowledge it conveys but the most innovative way in which it conveys in terms of short stories, essays and anecdotes.

Dr. Bhandari's insights are as incisive as is his unique ability to address the scientific basis of disasters like earthquakes, fires, volcanoes, floods, landslides etc. in most simple terms. He provides a solid knowledge platform through his lucid treatment of a complex subject of disasters — which will not only 'inform' but also 'influence' in our moving towards accurate prediction, astute strategic planning and effective decision making, when we face hazards, disasters, calamities and catastrophe.

My heartiest congratulations to Dr. Bhandari for his great service to the nation through this wonderful book.

Dr R.A. Mashelkar, FRS
President, Global Research Alliance and
Chairman, National Innovation Foundation
(Formerly, Director General, Council of Scientific and
Industrial Research)

I enjoyed reading the book. The author has adopted a unique narrative. It is easy on the mind of the reader. It is characterized by lucidity, clarity and directness in communication. Hence the messages are direct and not implied and do not need inferences. The book focuses on uninitiated readers in the first six chapters. The chapter on unopened book delivers a strong message on social behaviour. Objectivity in the analysis is retained throughout the book. Facts and accounts of real life stories are both gripping and straight. The book is informative, clinically correct on analysis of facts and adequately descriptive for the reader not having to exercise minds as to what the author might imply and wants to state.

The author has brought years of experience and deep insight into fruition in the form of the book that relates to readers and attempts to carry them through his own experience. The book seems to connect to the reader directly and conducts them through a journey of life. I must confess that I have not read such a book on a subject that connects to dangers for humans without frightening the readers. I congratulate the author, the Academy and National Book Trust.

Dr T. Ramasami, FNA, FNAE
Formerly, Secretary, Department of Science and Technology
Government of India and Director General, CSIR

* * *

I find the book highly fascinating and interesting. With the author's style of writing, as I have often consulted his other book, it is bound to capture the imagination of every reader and leave them spellbound.

Anil Sinha, *IAS* (retd)
Founder- Vice Chairman,
Bihar State Disaster Management Authority

I do not think any professional in the field of Disaster Management has ever attempted to write stories covering various facets in such a readable and anecdotal manner. It is interesting that the author's narration covers the entire spectrum of disasters viz earthquake, floods, landslides, Tsunami, lightening which he has experienced first hand. It is commendable that each story depicts a different scenario, thus absorbs interest of the reader. What really touched me was that the narration literally takes you into the realm of the environment as if the reader is actually there. Relating to the challenges that one experiences in such situations shall surely leave readers with goose pimples.

Lt. Gen. N. C. Marwah
Member, National Disaster Management Authority,
Government of India

* * *

I commend the author for the creativity to turn a dry subject as disaster management education into a subject matter of interesting short stories & anecdotes. This is surely a very powerful medium of communicating such an important subject to the young minds of impressionable age. The book will be an asset to the teaching of disaster management, especially in schools.

J.C. Pant, *IAS* (Retd)
Formerly, Chairman
High Powered Committee on Disaster Management
Government of India

* * *

I have read many publications of the author and each one is unique and innovative in its own way. The present book by the author demystifies the complex subject of Disaster Risk Reduction through speaking short stories, essays and anecdotes. I compliment the author and the National Book Trust for publishing the book which, in my view, makes an unusual entry into the world of literature on disasters. I'm sure it will be affordable and easily accessible to the masses, but I also hope that it gets printed in other Indian languages as well. Personally, I will see that in my State Sikkim, this book reaches all Schools, Universities and Colleges.

Professor Vinod K. Sharma
Vice Chairman, Sikkim State Disaster Management Authority
Professor, Disaster Management
Indian Institute of Public Administration, New Delhi

* * *

You are going to open an unusual book. It is neither a textbook nor just a collection of children's stories. Through short stories and essays written with the ink of his experience, the author, who is a world-renowned expert, quite simply conveys the basic lessons in disaster mitigation through interactive dialogues. The book forearms the society, especially the younger population, and spreads the culture of safety against disasters.

Dr. Alexander Strom
Chief expert, Geodynamics Research Center – branch of JSC
"Hydroproject Institute", Moscow, Russia

* * *

This book offers important lessons and insights aimed at improving the existing practices in disaster management across all levels. It is a reflection of the author's experience which shines through the various examples spread across the book. Through the breadth of its scope, the interesting facts, fascinating examples and compelling storytelling, the book will captivate the minds of readers, adult and more importantly young alike.

Mihir Bhatt
All India Institute of Disaster Mitigation, Gujarat

* * *

As a kid, when my parents told me stories from "The Gospel of Sri Ramakrishna", and later when I started following the great man 'Jiddu Krishnamurti', I never realized that education related to disasters (earthquakes, tsunamis, cyclones, hurricanes, avalanches, volcanic eruptions), could be imparted to the young minds and common populace in a similar manner. This book reaffirms that yes, it could be done so easily. It is a must read by everyone.

Dr. D N Singh, FNAE
Institute Chair Professor
Department of Civil Engineering, IIT Bombay

* * *

This book is another masterpiece from the author. It is bound to capture the imagination of the whole range of readers and inspire generations to aim at the culture of sustainable living and surviving in the whirlpool of natural hazards and man-made disasters.

Professor Chandan Ghosh
National Institute of Disaster Management
Government of India, New Delhi

* * *

The Short Stories, Essays and Anecdotes on Disasters is the first book of its kind which comes to its readers with multitude of lessons in disaster safety. What makes the book special is that these stories are hitherto untold, well illustrated and captivating. They are long enough to cover the subject and short enough to sustain the excitement of the reader. It is only through speaking stories that we can fire the imagination and transform people from story readers to story makers! Of the many things, this book will also teach that even those unequal within a society are equal before disasters.

Dr R. K. Bhandari is a passionate champion of disaster education, a noted geohazards expert, an acknowledged research scientist, a teacher, a practitioner and above all a day dreamer of disaster-free India. Currently, he is the Chairman of the Forum on Disaster Mitigation of the Indian National Academy of Engineering and a Member of the National Advisory Committee to the National Disaster Management Authority. He is the only Indian so far to have received the coveted Varnes Medal, the highest International award for 2012 given at the UNESCO headquarters in Paris, for excellence in Landslide studies. He is the author of the book *Disaster Education-A joy ride for students, teachers and Disaster Managers.*

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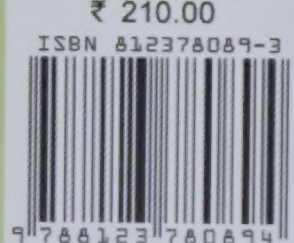

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